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THE

Journal of the Society of Arts,

AND OF

THE INSTITUTIONS IN UNION.

110th Session.] FRIDAY, APRIL 29, 1864. [No. 597. Vol. XII.

Announcements by the Council.

Ordinary Meetings.

Wednesday Evenings, at 8 o'clock.

May 4th.—" On the Testing of Chain Cables." By Frederick Arthur Paget, Esq., C.E.

Cantor Lectures.

The concluding lecture on "Chemistry applied to the Arts" will be delivered by Dr. F. Crace Calvert, F.R.S., on Thursday evening, at 8 o'clock, as follows:—

May 5.—Lecture VI.—Animal Liquids.—*Bile*, its purification and detergent properties. *Blood*, its application in the refining of sugar and the manufacture of albumen. *Albumen*, its use in calico printing and photography. *Urine*, its uses. *Milk*, its composition properties, falsification, and preservation. A few words on putrefaction.

Albert Medal.

The Gold Medal established by the Society in memory of its late President, the Prince Consort, to be called the " Albert Medal," and to be bestowed, from time to time, "For distinguished merit in promoting Arts, Manufactures, and Commerce," has been adjudged to Sir Rowland Hill, K.C.B., in recognition of his eminent services to all classes of the community in the creation of the Penny Postage System and other Postal reforms. The following letter has been received from Sir Rowland Hill:—

Hampstead, N.W., April 22, 1864.

Sir,—I have the honour to acknowledge the receipt of your letter of yesterday's date, informing me that the Council of the Society of Arts have awarded to me the " Albert Medal," in recognition of my services in connexion with Postal Reform.

I beg you will do me the favour to express to the Council my grateful acknowledgments of the honour which they have been pleased to confer upon me—an honour which, whether with reference to the high character of the Society in whose name the award is made, or of the lamented Prince in whose memory the medal has been established, will ever be held by myself and my family in the highest estimation.

I have the honour to be, Sir,
Your most obedient servant,
ROWLAND HILL.

P. Le Neve Foster, Esq.,
&c., &c., &c.

Proceedings of the Society.

Nineteenth Ordinary Meeting.

Wednesday, April 27th, 1864; Sir Thomas Phillips, F.G.S., Vice-President of the Society, in the chair.

The following candidates were proposed for election as members of the Society:—

Buss, Thomas O. L., 33, Hatton-garden, E.C.
Chifferiel, Frederick, Dulwich, S.
Clarke, John Joseph, 54, Chancery-lane, W.C.
Hook, A. Clarke, Worcester-park, Kingston, S.W.
Hook, F. C., 13a, Great George-street, S.W.
Jeffries, George, Woolwich, S.E.
Kirkman, Gardinelli S., 27, Claremount-terrace, Fentiman's-road, South Lambeth, S.
Lefeuvre, W. H., 18, Great George-street, S.W,
Martin, Charles Wykeham, 25, Cumberland-street, Hyde-park, W.
Ordish, R. M., 18, Great George-street, S.W.
Parkyns, Sir Thomas G. A., Bart., 9, Gloucester-sq., W.
Reibey, Archdeacon Thomas, 38, Gloucester-terrace, Hyde-park, W.
Smith, W., 11, Staple's-inn, Holborn, E.C.
Stephens, Gilbert, 13, Northumberland-st., Strand, W.C.
Thompson, Charles Edward, 8, Colet-place, Commercial-road, E.
Webb, Francis, 31, Southampton-buildings, Chancery-lane, W.C.

The following candidates were balloted for and duly elected members of the Society:—

Farries, R. Spearman E., 13, George street, Mansion-house, E.C., and 10, Basinghall-street, E.C.
Mostyn, Charles, 8, Cornwall-villas, Westbourne-park, W.
Yeats, Anthony George, Collinson-house, Effra-road, Brixton, S.

And as Honorary Corresponding Memrer.

Menn, Charles, Secretary of the Institute of Science, Geneva.

The adjourned discussion on the paper " On the Patent Laws," read by Mr. Thomas Webster, F.R.S., at the last meeting, was resumed by

Mr. Newton Wilson, who said it had been a matter of some surprise that the principle of the patent law should, at this stage of our national history, be called in question, while it was a thing which had been admitted by, he might say, every civilised nation in the world, and by almost every semi-civilised nation, as a necessity of advancing civilisation. He took it that, as a nation advanced in civilisation and in arts, the necessity of giving some encouragement and some protection to the products of inventive genius was absolutely necessary. In what they might call semi-civilised nations, such as Brazil, Chili, and Mexico, patents were given without any government duty whatever; and why? because they found it necessary to give assistance to enterprise and encouragement to the introduction of new inventions in those countries. Gentlemen who objected to the patent law on principle might, with equal justice, object to the legislation recently adopted for the security of trade marks. On the same principle, he could imagine objections to the law of copyright and the registration of designs. He believed that nine-tenths of the members of this Society, if not ninety-nine hundredths of the manufacturing community, would endorse the principle of the patent law, though perhaps they would say it was objectionable in many of its details. There were unquestionably many anomalies in connection with that law. We demanded from the poor inventor a larger sum than was called for in any other part of the globe for what was called the protection of his primitive efforts. If it paid France or Belgium to take a small annual payment, in the one case of £4 a year, and in the other of only 10 francs, surely it would be sufficient for the purposes of this country if a corresponding scale were adopted, and he thought it would be found desirable to adopt—not the scale they had now of instalments, which prevented so large a number of patents from reaching the maturity of the final specification and the Great Seal. He thought that system would have to be considerably modified. The payment of a single £5 ought to be quite sufficient to complete a patent, and to meet all the demands of the government, and if an annual payment of a similar amount were adopted, he believed it would bring a larger amount of revenue than at present, while it would be exacting from the inventor a continuous payment for a continuous interest which he derived from his patent. A particular feature in Belgium was that the patent fees increased year by year on the principle that the patentee was deriving a yearly benefit from his property. He would refer to one or two anomalies in connection with patents. They had at present an arrangement by which it was presumed patents were examined, and it might be imagined that a patent which was not good would not be granted, seeing it had to pass through the hands of the Attorney or Solicitor General, and fees had to be paid; but this practically afforded no actual check. A large amount of the fees paid by inventors went into the pockets of the Attorney and Solicitor General, for such services as, he maintained, were totally inadequate. What, then, did they want? He maintained that they wanted a Board of Examiners, who should really examine into the invention and decide whether it was really new, and so avoid the granting of useless patents. They would also be able to tell whether the specification was sufficient. If that were done we should be saved from much uncertainty and litigation. The next point was the mode of trying patent cases. It appeared to him that for this to be properly conducted with advantage to both sides, there must be a special tribunal. He would have no juries in this court, for it was one where special knowledge was required. There was another point. It would appear that the present patent laws were enacted with a special view to guard the public. It was said by a very able speaker at the last meeting—the Chairman of the Council—that the public were not considered in the provisions of the patent law. He (Mr. Wilson) maintained that they were far too much considered, and that the interest of the inventor was too much disregarded. He maintained that the patent law was so constructed that if an inventor made a mistake in his patent he had the utmost difficulty in correcting it. There was no provision for revising his patent. There was a provision of disclaimer, but that was at the option of the Attorney-General, and, as Mr. Webster knew perfectly well, the Attorney-General might refuse a disclaimer, and then where was the inventor? But the very provision of the disclaimer as it at present existed was defective. It provided that certain words might be struck out, but it allowed the insertion of nothing that would clear the patent of the mystery that previously surrounded it. Another point of importance was patents of importation. In many countries of Europe, and in some of South America, patents of importation were allowed, but the same privileges did not extend to them as were allowed to patents of absolute invention. Here, however, the rights were the same, and the importer might prevent the real inventor from afterwards obtaining protection for his own invention. He knew cases in which the grossest injustice had been inflicted on inventors in that way. He had even known instances in which the inventor had been obliged to purchase the patent back at an enormous cost. Such a state of things, he said, ought to be remedied. It was alleged, at the previous meeting, by Dr. Bachhoffner, that inventors often made it their business to obscure the specification, so as not to allow the real objects of the invention to be clearly shown. From his (Mr. Wilson's) experience this rather arose from the shortcomings of the patent agents, and he thought that if they had such a court of examiners as had been suggested, it would lead to much greater care on the part of patent agents, and he thought that patent agents themselves should be bound to pass through some curriculum before they put themselves before the world in this capacity. One other point of importance was the necessity for a Patent Museum in this country. Why should we not have something like what they had in the States of America? He conceived the Society of Arts could not do better than to appoint a committee to confer as to the best means of introducing an improved patent law, the provisions of which should, far more than the present one, meet the wants of inventors, manufacturers, and the public.

Mr. **Steere** remarked that the word "patent" suggested many points for consideration; one was that every patentee was grievously oppressed by law proceedings, as was also the infringer. Now, what was the question to be tried between the parties? It was simply a mere matter of fact, which should be tried before a tribunal of experts (say a committee of the Society of Arts), and the only parties examined should be the patentee and his workmen on the one side, and the alleged infringer and his workmen on the other. But, as it now stood, the lawyer intervened, and, putting aside matters of fact, argued upon matters of law. It was then often discovered, upon legal reasoning, that the specification was insufficient. So little value did he (Mr. Steere) attach to the specification that he would abolish it altogether. The simple fact to be decided was, whether an invention was an infringement of a former patent, and to determine that question what consequence was it in what terms the invention was described? By some such plan as he suggested they would relieve both parties of the enormous expenses which attached to the present system of litigation. The case of "Young and Fernie" was a remarkable instance. He would offer another suggestion, which was, that the word "patent" should be dropped altogether, inasmuch as so long as it was retained they never would get rid of litigation. He would prefer that the term "licence" should be used. He contended that the present system of litigation of patent rights required to be placed upon a totally different footing.

Mr. **Murdoch** said it would take up too much time if he were to attempt to answer the arguments of those who opposed the patent system, or to unravel the intricacy of the statistics which they brought forward. He would, therefore, restrict himself to a few remarks respecting the means proposed for the remedying of evils attendant on that system. He entered upon the subject with diffidence, as he should have to call in question the policy and practicability of the course advocated in Mr. Webster's able paper, respecting the mode of granting letters patent. It was proposed to subject all applications for patents to a preliminary inquiry, made by a tribunal having power to refuse the patent in the case of want of novelty or merit in the invention to be protected.

Mr. Webster said he did not intend that the question of merit should be submitted to such a tribunal.

Mr. Murdoch continued: Now, it seemed to him that such a tribunal would, both in its principle and practical working, be in direct opposition to the spirit of patent law, the chief merit of our present system consisting in the fact of its being an equitable arrangement between the inventor and the public, by which the reward received by the former was in proportion, in some cases, to the benefit conferred by his invention; in all, to the commercial value which attached to any new means for supplying the wants or contributing to the luxuries of society. Further, if property in inventions was to be protected at all, it must be placed upon the same footing as other property, and be secured to its possessor without reference to its value. Every new invention, whether of great or small importance, was deserving of State protection, and the mode of conferring that protection by letters patent was the fairest both to the public and the inventor. If his invention were valuable, it was but right that he should enjoy the profits resulting from its use. These the law secured to him. If, on the other hand, his invention were of trifling value, the hardship (if any), suffered by others in being forbidden to exercise it, was but small. But if the invention were useless, there were provisions of the law which would meet the case by rendering the patent void, although the patenting of even a useless invention was attended by this beneficial result, that it placed upon record that which had been done in a manufacture, so that that which had been a stumbling block in the path of one inventor often became a stepping stone by which subsequent inventors attained success. But if the expediency of making the proposed distinction between inventions were to be granted, he did not see how the principle could be carried into practice. Nine out of ten of the inventions which annually became the subject of patents were necessarily in a state of infancy when the patents were applied for. This fact was recognised by the law, which granted an inventor provisional protection for six months, in order that he might make such trial of his invention as should satisfy him as to its value, and enable him to describe his invention in its most perfect form in his final specification. If, therefore, the utility of an invention were to be inquired into before the grant of protection, the inventor would be under the disadvantage of having to submit his invention for examination with all those imperfections which could only be removed by repeated experiments, and it would be judged of theoretically instead of upon its practical merits. The examiners, also, however capable and impartial they might be, would, owing to deficiency of evidence, find it difficult to do justice to the cases submitted to them. They would have to try questions of far greater importance than those which were tried by our present tribunals, for, whereas these decided whether an asserted right should or should not be maintained, the examiners would have to decide whether a man should have the power of asserting his right at all, and in doing this they would be without the facilities which were now afforded in our courts of law by the examination of witnesses conversant both with the old methods of practising a manufacture and with the new method in dispute. Mr. Murdoch instanced the well-known case of Betts *v.* Menzies in illustration of this part of his argument. In this case it was contended that Betts's patent was bad because the invention it protected was described in the specification of a prior patent, and it was not till the case had gone from court to court that Betts's patent was decided to be good. Now, all this litigation arose from the similarity of Betts's and Dobbs's specifications, which was such, that if Betts, in order to obtain his patent, had been required to submit a description of his invention for preliminary examination, the patent would, in all probability, have been refused, on the ground that his invention had been anticipated by Dobbs; and although the practical difference between the two inventions was exactly that between success and failure, he would have been deprived of his reward. This was but one of many cases which might be cited, to show the injustice which would be inflicted upon inventors, and the loss which would be sustained by society, if the novelty or merit of an invention were to be investigated before the grant of the patent, although he was willing to admit that, in some cases, the difficulties which he had suggested would be met by the plan proposed by Mr. Wilson, which he took to be this—that the usual provisional protection (six months) should be issued, but that the novelty and utility of the invention should be inquired into previously to the sealing of the patent. There were cases, however, in which years elapsed before the invention was brought into satisfactory operation, and to such cases Mr. Wilson's proposition would not apply. It had been said that the action of the preliminary tribunal would be analogous to that of the Privy Council in prolongation cases. There would, however, be this difference—the Examiners would have to decide on such evidence as might be collected during a period of a few months, whereas the Privy Council based its decisions on evidence that had been accumulating during the whole term of a patent. He did not think, however, that we need trouble ourselves to devise any system of preliminary examination, as the part of our patent system requiring reform was, not the mode of granting patents, but the mode of trying patent cases. The trial of a patent case was now so tedious, so expensive, and so uncertain, that men would often suffer wrong rather than go to law to obtain redress. The consequence of this state of things was, that inventors often took out patents without making due inquiry respecting the novelty of their inventions, and filed vague specifications, relying on the reluctance of others to contest their claims in a court of law, whilst, on the other hand, patents were often infringed by manufacturers and others, who hoped to wear out the patentees by the help of a long purse. In both cases capital became but too frequently a means of oppression. There were provisions of the present law which, if they could be readily and effectively administered, would be amply sufficient to meet such cases. There were remedies of the patentee against the public, and *vice versâ*. The difficulty was that in applying these remedies the whole case turned upon the construction of the specification, which was a duty to which our courts, as at present constituted, seemed to be unequal. The remedy was to be found in the strengthening of the court, as set forth in Mr. Webster's second proposition, viz., "That the validity and infringement of patents should be tried by a judge, assisted by two or more assessors, conversant with the subject." He thought it would be very advantageous to extend the functions of this court to the granting and extension of patents. The court would then perform the duties which were now performed by the law officers, our courts of law, and the Privy Council. The advantages of this arrangement would be that those who examined applications for patents would not go out of office with each change of ministry, by which system their experience in matters of patent practice was at present lost to the public, and the court would be fully acquainted with the history of each patent granted.

Mr. G. W. Hastings had listened with interest to the opinions that had been advanced on this subject by practical men who had taken part in the discussion. He confessed, as far as he was personally concerned, he had no other pretension to speak upon the matter beyond that of strict impartiality. He had no personal interest in it whatever, and he simply represented the interest which after all would have to finally settle this great question—that was the interest of the public. He thought it rather unfortunate that one or two of the speakers had, probably in the heat of argument, thrown some doubt on the right of the public to have any interest in the question. Now he had every respect for the interests of patentees, but he thought the public had a right to be heard in the matter.

It seemed to have been assumed by the gentleman (Mr. Spencer) who on the last occasion spoke in reply to the very admirable speech of Mr. Hawes, that if they once conceded that there was a property in invention, they at once settled the whole question, and that therefore the present patent law was always to be maintained. He begged to deny in the most explicit manner the force of that argument. He was fully impressed with the feeling that there was a property in invention, and that that property ought to be maintained. He thought when a great inventor gave to this country the benefit of some discovery, he was deserving of very high reward, and his merits ought to be recognised, but he did not see, while acknowledging that, that there was any necessity to maintain the present or any patent law at all. Let them go for a moment into this question. The gentleman who opened the discussion this evening told them that the patent law and the copyright law stood on precisely the same grounds. Now, he (Mr. Hastings) could hardly imagine two things more diverse, and it was from that misapprehension partly that so many errors had crept into the subject. He would give them an instance of the difference between copyright and patent law. When Sir Walter Scott wrote his "Waverley," he introduced into this country an entirely new species of literature—historical romance—and he obtained the copyright of that work, and it would have been piracy to have reprinted it *ipsissimis verbis*; but they did not by that grant to Sir Walter Scott a monopoly in the printing of historical romances. They did not say that for a certain number of years he should be the only person in this country to produce novels of that description. They allowed any one who chose to write historical romances; but the principle of the patent law was that they should confer upon one man who had invented a particular thing an absolute monopoly in it. The point he arrived at was this—granting there was a property in invention, was the present system of patent law the best system for securing that property either as regarded the inventor or the public? He would deal with the question first as regarded the public. In ancient times it was considered that if an enterprising navigator discovered a new country, the only proper way to reward him was to make him a grant of that country; but in process of time it was discovered that the better plan of reward was to give a suitable recognition of the discovery and throw the land open to public use and occupation. Much the same question was involved in the patent law—whether there was not a better way of rewarding than giving a monopoly? The argument on public grounds had been that by granting patents they encouraged invention. But what did one speaker say?—That under any circumstances they would have invention—that invention, once in the head, it must come out. He quite subscribed to that. He believed the faculty of invention was like the faculty of poetry, or of art, and if a man had that genius within him he was sure to invent. If that were true, as the gentlemen in favour of the patent law had informed them, it seemed that the case of the patent law, as far as the public was concerned, fell to the ground; for it was clear the public had the benefit of the invention, whether they rewarded the inventor or not. In that case every shilling paid in fees to the patent office was so much useless burden upon the public, for, after all, it came out of the public purse. It seemed to him, as far as the public was concerned, the patent law, on its present footing, was wholly indefensible. He would now consider the question from the inventors' point of view. Was the granting of a monopoly the best means of rewarding him? If there was any truth in the facts and figures of Mr. Hawes it seemed a bad way of rewarding him. It seemed to create a lottery in which very often the best man lost and the worst man won. It seemed a mode of rewarding which might not only fail in its object, but might lead the unfortunate inventor to spend his whole life in an idle pursuit of riches. He thought, as far as the inventor was concerned, a more satisfactory plan would be that each invention should be valued by a competent tribunal, and that it should be rewarded by a certain sum at once from a public fund, upon its being declared to be a true and really good invention. That would surely be a more certain and, he apprehended, a more satisfactory plan than the present system of patents, and he thought this the more, because he could not help feeling how inadequate had often been the rewards to really great inventors of this country under the present patent law. Large fortunes had often been made by men whom it would be ridiculous to term inventors—men who had made some trifling modifications, while those who had conferred illimitable advantages, not only on this country but on the world, had sometimes been left to die in poverty. He trusted he had demonstrated first, that the present system was not satisfactory to the public, and secondly, that it was not so to inventors. If that were the case, he thought the legislature of this country, enlightened by the assistance of this Society, should take the matter into consideration, and enact for the benefit of inventors, as well as the community, a system which would be satisfactory to both, which would give the best reward to genius, and would not deprive the public at large of the free use of the invention.

Mr. Walter Hancock said that the policy and operation of the patent law had been forced upon his attention by an experience of its working for nearly twenty years. No one could deny that that working was unsatisfactory, sometimes grossly unjust; so much so, that it was even possible (as was suggested by Mr. Hawes) for a man to have his invention snatched away from him, and if he neglected to follow it up closely to the doors of the Patent-office to see, by operation of law, the legal title to his property conferred upon another. But this monstrous scandal, although within the letter of the law, was diametrically opposed to its spirit; it was an evil not necessarily inherent in the law, but possible only from its present lax and clumsy administration. To an enterprising manufacturing country like ours, the subject was one of great importance and of great difficulty. The views entertained as to the policy of any law for the protection of patent-right were as wide asunder as the poles, for inventors too often insisted that it was the duty of the State to establish a system for their especial and ample protection, overlooking the fact that the law owes duties to the public as well as to the inventor; on the other hand, persons entitled to great weight maintained that the policy of patent right was essentially vicious, and opposed to the principles of a sound economy, inasmuch as it created a monopoly. Between these two extremes there was ample room for a sound and beneficial law. The staunchest opponents of patent right would not deny that the inventor of a new and useful invention was entitled to a substantial reward of some kind. We were told, indeed, by a few that invention, like virtue, would prove its own reward; this would only apply to the pure philosopher, who pursued the study of science for its own sake. We were told that the state should reward inventors, but what was to be the nature of this state reward? A decoration, a riband, or a nomination to a legion of honour? He did not wish to undervalue these acknowledgments, but they were not the considerations that would weigh with the body of our countrymen as a stimulus to invention. Then we were told that the state ought to give pecuniary rewards. He maintained that it would be impossible to work out such a problem either satisfactorily or economically. How difficult it was now to get the Admiralty or any Government body to appreciate or take up any new invention, however valuable. If a department of the state were charged with the duties of examining and dispensing rewards for new inventions, was it not probable that instead of 3,000 we might have 30,000 claimants per annum? And should we not require for this purpose a machinery and a body of experts more extensive and costly than that which was advocated for the preliminary examination of patents?

Another serious objection would be that these rewards would be a heavy charge upon the State, whereas the present law was not only self-supporting, but left a surplus, which, as Mr. Webster justly said, ought to be applied wholly to the encouragement of invention. He could not but come to the conclusion that for the people of this country, who appreciated everything by its value in pounds, shillings, and pence, the only feasible reward was the commercial one, such as was conferred by patent right; because such a reward would usually be as nearly as possible equivalent in value to the benefit which the public themselves (by the purchase of any patented article or process) considered that the inventor had conferred upon them by his invention. Now it was easy to "give a dog a bad name," to raise an unfair prejudice against patent right by stigmatising it as a "monopoly," as a remnant of the laws of olden times. He considered that Mr. Webster had demolished the argument that patents were monopolies, by showing that they deprived the public of no existing right or benefit, because they referred only to new trades or processes created. He (Mr. Hancock) must demur to the proposition of the chairman of the council, that "patent right was a remnant of the law of olden times." Placed side by side with invention, patent law was of comparatively recent date. In olden times there was no patent law; there was no necessity for it; nor was there any necessity for copyright. Inventions were "few and far between," and it was while in the actual enjoyment of that reward for which the author or inventor of the present day had to strive so hard, that many of the great works and inventions of old were completed. To what higher reward could Virgil aspire, when engaged upon his Æneid, than the patronage and bounty of Augustus? Or Horace than that of Macenas? Was it not at the court of Hiero, of Syracuse, that Archimedes made the great discovery of specific gravity? But, if the proposition were correct, that patent right was a remnant of the laws of olden times, that alone would be no argument for its abolition. If we wished to descend from the proud position that we occupy of being the greatest, freest, richest nation in the world, we could not do better than begin by abolishing some of our laws of the olden time, such as trial by jury, which was said to have existed about 1,000 years, Magna Charta for about 650, and Habeas Corpus, which might be said to date from the same century as our patent right. He contended that what was vicious in the olden laws of monopolies was abolished by the Act of 1624, and that the legislature exercised a wise discretion when they excluded from its operation the patents for inventions. So far, therefore, from regarding patent right as a law that ought to be abolished, he looked upon it as a necessity of the present time. This subject had been fully discussed at the meeting of the British Association at Manchester in 1861. Mr. Curtis (then Mayor of Manchester) gave a striking instance of the necessity of a patent law. His firm had spent upwards of £10,000 in the perfecting and introducing a new machine; without a patent right it would have been open for any engineer to have availed himself of all this outlay, and actually to have made and sold the improved machine, and got a profit, at a price at which the inventor himself, with this outlay to make up, could not possibly compete. If the opponents of patent right charged its advocates as monopolists, surely their own principles too nearly approximated to those of the communists. He (Mr. Hancock) could give a more striking instance, drawn from his own experience, of a new invention and manufacture that would not have been prosecuted but for the patent law. About twenty years ago there was introduced into this country and to this Society, a substance new to us—gutta percha—and for the introduction the Society rewarded Dr. Montgomerie with its gold medal. It was introduced as a scientific curiosity, in the hope that means might be devised for rendering it a useful material in the manufactures of this country. Hitherto it had answered no such purpose, although it had existed for probably 5,800 years. It could not be obtained without great difficulty; it was necessary to penetrate tropical forests, inhabited by tigers, at a distance of 15,000 miles from home. It was not, therefore, without considerable labour and enterprise —it was not, in fact, until after the undivided attention of three gentlemen for a period of three years, and the assistance of others, and at a total expenditure of nearly £25,000, that any manufacture for profit could be attempted. He would confidently ask, would the inventors and capitalists have combined to do this but for the protection of the patent laws? What had been the result? The public had been largely benefited by the many purposes to which this substance had been applied, but especially by its application to submarine telegraphy. When we recalled that the old Atlantic cable by one message saved this country upwards of £50,000, that during the Crimean war the Black Sea cable was estimated to have saved this country upwards of £1,000,000, and that besides this we had for 12 years enjoyed submarine telegraphic communication with the continent, it must be obvious that the benefits, direct or indirect, conferred upon the public by gutta-percha were incalculable. He would grant that the gutta-percha patents had produced an immensely handsome reward. He would grant that, as was too often notoriously the case, the bulk of that reward had been reaped, not by the inventors, who conferred the benefit, but by the enterprising company who worked the inventions, and to whom for their enterprise some degree of credit was unquestionably due; but he would firmly maintain that the benefits conferred upon the public had been immeasurably greater than those conferred upon the inventors and their coadjutors, and that in the true spirit and interest of the Patent Law, the contract entered into by the crown on behalf of the public, by which, in return for the invention, the crown granted a patent right for the limited period of fourteen years, was a just and beneficial contract.

Mr. J. A. **MACFIE** said he felt very much honoured and gratified in having the opportunity of being present and listening to the discussion, and he was only sorry that the cause which he espoused had so few advocates in a place where, above all, he should have thought that it would have found friends to support it. He was glad that the hon. secretary of the Association for Promoting Social Science had addressed the meeting so well and so ably, and he was afraid that in having to follow him he should prove the great advantage of professional men over plain men of business. The subject was a very large one, and had been most ably brought before their notice by Mr. Webster, whose paper embraced questions which had been very often debated, namely—right of property in inventions, what reward ought to be given to men of genius and men of skill who benefited the public by their inventions, the present state of patent law in Britain, and the best remedies for the evils which were universally admitted to exist. These subjects could not be considered without also taking into consideration the state of affairs with regard to inventions in other countries with which England stood in relation, and the changes which had come over British commerce and British manufactures by the introduction of free trade. The principle which had been advocated by many in this Society, when reduced to different language, was, that every man who made an invention had a right to prevent others from doing what he had done. That was, in plain terms, the proposition which they were asked to receive. Without going very far into the subject, he would only remark that it was very fortunate for us that we did not live in the days of Adam and his immediate descendants, for then everything was new and everything was an invention, and our race would still have been savages. He could not think that anything which would not apply to such a state of society could be consistent with the Divine law, and since he took such high ground as that, they would allow him to say that he thought that many of the things which were said on this subject were hardly consistent with the principles of the religion which prevailed in this country. Those who doubted the advisability of this system of rewarding inventors by means of monopolies were not averse to any amount of honours. One of the speakers had rather disparaged honours, but he could say for himself that he would rather have some honour, some acknowledgment from the Queen, some proof that he had served his country, than he would receive a thousand pounds; and he was quite sure that there were many who were influenced by the same feelings. But although they heaped honours on those who really deserved them, yet he was sorry to say that one of the defects of the present system was, that it was no honour to be a patentee, for they were only a class of persons many of whom pretended to be inventors without having done anything at all meritorious or deserving of the privileges which they enjoyed. With regard to the question of property in inventions, he would offer one or two observations to show that, in the ordinarily accepted sense, this could not exist. What was bought was not the invention but the secret. The patent was the recompense, not for the invention, but for the secret, and the proof of that was that a reward was given to any man who imported an invention, and in that case the reward was not for an invention, but for having communicated to the country a secret; therefore the property was not in the invention but in the secret. Canada, acting on this principle, had stipulated that she would give no patent but to those who were resident within her own territories. He only gave this as a proof that, even in our own colonies, where they had got emancipated from the old traditions of our country, they actually acted upon the principle that there was no inherent or natural property in inventions. It occurred to him, however, that our friends on the other side of the Atlantic would show a little more good sense if they would consider the public interest rather more even than that of those favoured few who made inventions. In point of fact, in their way, they did consider the public, because their practice simply amounted to this, that they presented gratuitously to the colonies of Great Britain the produce of all the inventions which we pay for, and thereby hung a thought which required great attention in these times, namely, that the people of Great Britain were throwing upon the manufacturers of Great Britain the great burden of patents, and at the same time, as Mr. Hawes had very properly stated, they were calling upon them to compete, under free trade, with all countries in the markets of the world, and with those who were using our inventions without paying for them, while our manufacturers were obliged to pay the heavy royalties which patentees demanded. What had to be considered was, the best means of getting rid of these heavy burdens, which would prevent Britain from running successfully in the race of commerce. Another proof that there was no natural property in inventions was afforded by our own law, because if there really was any property in an invention it would go to a man's heirs and successors, and would not go from him at the end of the fourteen years; this, however, was not the case, and it plainly showed that this was not what we called "property." Again, another excellent suggestion had been made by Mr. Webster, and was entitled to all the weight which anything coming from him deserved, and that was that there ought to be the privilege of a compulsory sale, which could not, of course, exist in the case of property. The second proposition of our patent laws, when reduced into shape, was that every man who found out a new way of doing a thing, must first undertake a very heavy task. Before a man could use his own invention he must do what would be the work of a lifetime, namely, inquire whether anybody else had the plan patented. If he made any discovery, he must first of all, before he could do anything with it, go to the patent office, and to all the various manufacturers who used the particular machine in connection with which he had made his discovery, and ask them if they had ever seen his way of doing it before. Surely this was a most preposterous state of things! He said it deliberately, that if he was a patentee he must either neglect his business to attend to his patent, or else he must neglect his patent. What he held was, that if a man was a patentee he must go to all parties connected with his trade, and tell them what his plans were, and make arrangements with them. Another hardship was for a man to find himself duped after he had made his arrangements with a patentee; but he was sorry to say that the present laws enabled persons to be victimised in that way. Above all, it must never be forgotten that times were changed, and that we were changed too, and that we were not consistent in maintaining patent laws, which only tended to restrain trade.

Admiral Sir **Edward Belcher** said the question of absolute invention, of the strain on the brain in bringing the first idea into satisfactory action, could only be comprehended by those men who had toiled, and dreamed, and expended time and money in perfecting an invention. Inventions which deserved the protection of patents should only be discussed by actual inventors. If it were assumed that the great men who had risen to eminence in their different pursuits, saw no bright light ahead which was destined to reward them for their labours, it was most probable that, counting the cost, the waste of time, and the ungenerous return which inventors experience from the public, they would at once exclaim, "Better far stick to my work with the tools I have than fool away my time that others may benefit by my exertions." Inventions, however, in many instances, were not the result of absolute study for a decided purpose; in some cases the result of mere accident. An instance of this had occurred to him without the slightest idea of seeking for or taking advantage of it. He was engaged in turning a very hard wood, which threw off very fine bright sulphur-coloured shavings and dust, and had invited a party to dine on board his ship. His steward warned him he had barely time to dress, and brought him hot water. It was near the equator, and the exertion of turning had produced profuse perspiration. He washed his face with the plain water and got rid of the fine dust. The moment he began to use the soap to his hands and nails they were immediately dyed of a bright red, and in that state he was compelled to receive his guests. That, however, was his secret; he had, *malgré lui*, discovered a dye. Now what was the effect of a discovery made under such circumstances? For the moment he followed it up, amused himself by dyeing flannel, cloth, &c., but his time was too valuable; he had other duties demanding his attention; it would not pay, and it passed unnoticed. So would it be with engineers and workmen—unless they saw the course open, by the protection afforded by patent, they would in a similar manner neglect discoveries of the utmost importance.

Mr. **George Clarke** said that when in a discussion of this kind men of such distinction as Mr. Hawes, the Chairman of the Council, Sir William Armstrong, and others who had evinced the highest talent and the soundest discrimination, expressed the views which they had, it became the duty of inventors and of the public, whose interests were really identical, to stand up in favour of protection to inventors. There had even been some hints in the legislature as to an intention to abolish the patent laws, and he thought it was, therefore, incumbent upon inventors to do their best to refute the hollow arguments by which it had been attempted to be shown that inventions should not have protection. Mr. Hawes said that protection by patents was detrimental to our own manufacturers, because it held out a premium to manufacturers abroad to reproduce our best productions. He confessed that he had read that observation with surprise, and he could not even now quite understand it. It was supposed that from a specification, foreigners could at once seize all the ideas of an original inventor, and be able to carry his plans out.

Unless that was the view taken, where was the danger to the interest of the country in publishing specifications. They all knew, however, the extreme difficulty of carrying out inventions. It was not always the original inventor who carried out the invention, but it was by the combination of his talents and the capital of others, which he was able to command by having secured a monopoly, that at last the public was presented with all the fruits of the invention. Surely the original inventor had the best chance of bringing his invention to bear, and he certainly thought that the danger to this country was very little of its trade being injured by foreigners taking up our new inventions. But now that free trade existed, supposing the result to ensue which was stated in the arguments of those who stood up for the public, then it would be to the benefit of the public if the foreign manufacturer should be more successful than the original inventor, in carrying the invention into practice. They all knew how difficult it was to seize the ideas of others from any written description. It was almost impossible to understand an invention without diagrams and drawings. He knew a case in his own experience in which, in order to introduce spinning machinery into Belgium, although the drawings and specifications were published, the foreigners were obliged to send a skilful workman over to England to engage himself in the manufactory. He saw no reason, therefore, on that ground, why patents should not be granted for inventions. Another point which had been referred to was the great number of patents which had been taken out, and the great loss, as it had been said, to the public. This fact, which had been put forward so prominently as an argument against the patent laws, and a condemnation of inventors, was, in his opinion, the highest proof of the great utility of protection, even in the shape in which the law now afforded it. He would not now enter into the present state of the law, which he admitted to be very defective, but what he was advocating was the existence of protection to inventors. It was nothing but the patent law which had brought forth this great number of patents. It was the hope of reward which had stimulated inventors, and which had induced men to become inventors when otherwise they would not have been so. That which happened in all other cases happened in this case; for after all the shape which a patent took was that of a commercial enterprise, and nothing more. They must evoke the spirit of competition, and if they did that then they would at once obtain those results which had raised this country to the pinnacle of greatness. The great merit of the existing patent law was that it stimulated inventors to compete for the great prizes which were only the rewards of success. They all knew, when they started in the race, that they could not all be successful, but this was the case in all professions and occupations. Therefore, this argument, which was used against protection to inventors, was really the strongest argument in its favour, for it was quite a mistake to suppose that the number of applications for patents represented the same number of real inventions. The number of patents worked in this country, in proportion to the population, was less than in Prussia. He had just been told that the number of patents granted there was only seventy per annum; but the system there was very exclusive, and the committee of experts refused any patent which they did not understand, and, therefore, the number was very much reduced.

Mr. Winkworth said that he had intended to enter, at some length perhaps, into the discussion, but his friend Mr. Hawes, in his admirable speech on Wednesday last, had so fully anticipated any arguments he could have adduced in support of the views they held in common on this subject, that he would content himself with a few words only. Having about ten years since, on the occasion of a paper on the patent laws read by Mr. Webster—distinguished like that with which he had favoured the Society at their last meeting, by acute reasoning, if not by conclusive arguments—taken a rather prominent part in the discussion, he could not reconcile it to himself to be quite silent that evening. Although in the debate to which he referred only one other member besides himself, Mr. Denison, advocated emancipation from the paralysing influence of these laws, it was spread over no less than three meetings. Either, therefore, the arguments they had advanced were very cogent, or those who adopted the views of Mr. Webster, being themselves inventors and too much dazzled by the prizes which they saw dangling before them, were too much interested in the retention of the law to see clearly that the statements they made of the hardships imposed on inventors by these laws, were precisely those which established their utter worthlessness. For his present purpose it was not necessary that he should affirm or deny that invention or discovery, when published, was property, but it must be borne in mind that such publication was voluntary and not compulsory. All that he argued was that in the interest of progress in art, science, and manufactures, even in the interest of humanity itself, these laws ought to be repealed. Since the time alluded to above, other and more important opponents of these laws had entered the field: it was sufficient for his purpose on the present occasion, though there were many others whom he might name did time permit, to refer to the late eminent engineer, Mr. Brunel, who, in the chair, when Mr. Hawes read a paper on "the Soap Manufacture," eagerly availed himself of the opportunity to confirm Mr. Hawes's complaint of the impediments to improvement which these laws presented at every turn, and to condemn them from dear-bought experience. In fact he denounced them in the most emphatic language, as having been a constant source of annoyance, difficulty, and loss, the full extent of which it would be difficult to exaggerate. In this he (Mr. Winkworth) fully concurred, and nothing had taken place since that time to alter his conviction that these laws were not susceptible of improvement, and so long as any similar enactments, professing as these did, to encourage invention, were suffered to continue in operation, the complaints so frequently repeated during this discussion in various forms, would be urged by the sufferers from them. He need scarcely add that the views he had long entertained were confirmed by the discussion, so far as it had gone.

Captain Selwyn, R.N., said, as a member of the Council of the Inventors' Institute, he felt it would not be well if the discussion were allowed to be closed without expressing the opinion of that body. They felt it to be their mission to protect the interests of inventors, and he was there to say distinctly, that although there might be defects in the present system, and although the laws might be very faulty, and the interests of inventors and the public might appear to be antagonistic, this was not really the case. The first question started by Mr. Webster was, whether inventions should be encouraged and inventors rewarded. No one could have attended the discussions which had taken place without seeing that the general sense of the meeting was to affirm this proposition. He did not see the good of having a board of experts, for his experience of boards had taught him that, if parties applied to boards, they were sure not to get anything done as long as there was any possibility of anything being staved off. He did, however, rely on one board, and that was the public. The public was the great body of experts who seldom or never made an error, and who gave a really practical decision on a patent by giving money for it, and in that way the inventor was very fitly and properly rewarded. But few of the inventions which were brought forward would ever be carried out successfully, if the whole energies of one individual were not devoted to that single object. There had been something said about injustice to the public and the manufacturer. The manufacturer was not obliged to buy an invention, and if he bought a patent and found himself taken in, he had no more right to complain than a man had who had bought a horse without a warranty, and then had found it to be unsound. If he acted on his own judgment, without making proper investigation, he must not be surprised if he was duped. He thought they should never pull a brick out of any structure without they had a better one to put in, and in this case that had not been brought before them. Certainly it had not been brought forward at this meeting. He entirely denied the argument which had been used in connection with the copyright law, and he thought that the manufacturers had not spoken of inventors in the way in which they should, because it must be remembered that it was the inventors who had made the manufacturers what they were, and who had made our great nation what it was. But for them, mankind would now be in much the same condition as they were in the time of Adam. No doubt such men as Sir William Armstrong and Mr. Hawes were in positions which rendered them independent of the patent laws, but he could not conceive of any engineer, mechanic, or artizan, wishing to do away with such a stimulus to exertion and improvement.

Professor **Wanklyn** wished to correct a remark of one of the speakers, who said that patent laws existed throughout the whole of Europe. There was certainly one place where there was no patent law, and that was Switzerland, and, indeed, throughout a great portion of Germany there was virtually no patent law, for everything had to be patented some thirty or forty times before a patent became valid. According to this it would appear that there was at least one part of the civilised world where patent laws were in disrepute. He would just say one word as to why patent laws should be abolished. The justice due to inventors was often insisted upon, but why was it just to reward an inventor? Only as an example of this great principle—that it was just to reward individuals who conferred great benefits upon society, but who reaped no reward themselves. Now, was this practicable? Could we do this? He thought it was utterly impracticable. There were a great many people besides inventors who conferred immense benefits upon society, but who themselves reaped no rewards. If, then, there was no other argument for the law than that general principle, it must fall at once, because if once they admitted it, it would lead them too far. He would give a very common instance as an illustration. Everybody knew now a days of the immense improvements which had been made in the production of dyes. Dyes had been produced, as everybody knew, from coal tar. In the production of these dyes about a hundred people had been employed in order that this end might be produced. What did the patent law do? Why, it did not confer any reward upon any of those hundred people, but only just upon the last man, who appeared to put the last stone to the edifice which others had raised. Now was this just? Why should they single him out, and pass over all the others? The system was an unjust one, and he believed there was nothing in this country so unfavourable to science as the patent laws.

The **Chairman** said he thought the meeting would agree with him that the subject had now been sufficiently discussed, to make it right that he should ask them to do what he was sure it would be very gratifying to them to do, to express their thanks to the author of the paper, who would be afforded an opportunity of making observations in reply to some of the arguments which had been addressed to the various questions raised by his paper. He should like, however, with the permission of the meeting, to make a few observations upon the subject matter of discussion, before he conveyed their thanks to Mr. Webster for the paper which he had read. He thought it was very fortunate that the subject had been introduced by a man who had himself had so much personal experience in the working of the patent law, and who had had a large share in the framing the patent law of 1852, or at least in the combining of two bills into one Act of Parliament, and who since that time had had great experience of the working of the Act. He would not, however, consider the merits or demerits of the Act of 1852, which regulated the forms of procedure necessary for acquiring patent rights, but would limit himself to an inquiry into the claims of inventors to some public recognition. With the exception of one or two gentlemen, there had been but little disposition to deny the claims of men who had invented important improvements in manufactures to some kind of recognition. He thought the general objection had been rather to the form of recognition by means of the patent law. If it were fitting to reward intellectual results in the form of inventions, or of works of literature, or art, the question then arose whether the protection of inventors for a limited period of time was a reasonable character of reward. They knew that there had been in this country, and doubtless in others, some subjects for which the state had offered rewards, such, for instance, as the important discovery of the longitude at sea, for which a state grant was made to Harrison. Then again, there was the north-west passage, which the state thought of so much importance that its discoverer would be deserving of a large national reward, and although the state by these acts had recognised the right of reward for great services it was obvious that with regard to the greater number of inventions such a mode of reward was utterly inapplicable. It had been said, by some gentlemen who did not deny the right to a reward, that it would be better to give that reward out of some public fund. He thought, however, that the greater part of the meeting would adopt the views enunciated by Captain Selwyn, that, however desirable a public board might be to decide as to the novelty of any particular invention, the public were after all the best judges. No public department could successfully accomplish the desired object, so that they were brought back to the system already adopted in this and other countries. It seemed to be considered that whether in connection with literature, science, art, or invention, protection of the inventor was the most convenient, the justest, and the best reward which could be bestowed upon him. All that was done was that, for a limited time, he was allowed the use of his invention before the general public could have the benefit of it. He could not himself see what injustice there was to the public in that. He would refer them to the statute of James I., and ask them if the words of the statute could be improved; and when it was said that this law was a relic of the olden time, it must not be forgotten that America adopted the principle of it in 1790; and that in 1791, at a time when privileges were not very much upheld in France, it was also adopted by that country, and since that time the same principle had been introduced into other countries. The words of the statute, which was for awarding monopolies were, that it should not extend to letters patent for the term of fourteen years for the sale, working, and making of new manufactures, which shall be " neither unjust, mischievous to the state, nor hurtful to trade, nor generally inconvenient." Could there be a better definition of what the public should reward than that? Something had been said about the patent law being injurious to free trade, but it seemed to be forgotten that all the greatest political economists of our country were in its favour, Adam Smith, Bentham, and John Stuart Mill; and, therefore, when gentlemen talked about its being in opposition to free trade, and looked upon those who supported it as being still in ignorance of sound economical principles, they might be fairly answered that opinions coming from such men as he had just mentioned were at least worth consideration. He would also ask those gentlemen to remember that all the existing laws of copyright had been passed in the present reign, and that only two years ago this very Society, by its own laborious efforts, succeeded in getting an act passed for giving artists a copyright in their works, so that this species of protection was not such antiquated legislation as some people described it to be. Then it was said that the present system was unjust to inventors; but he would rather let the inventors determine that question for themselves, and they certainly seemed to be satisfied with the principle of the protection afforded to them, and to desire to preserve it. The gentleman who spoke last had complained that under the present system, one was rewarded while another was not, but he was very much afraid that that would be found to be the case in all things in this life. Then the question remained whether it was an injustice to the public that an invention upon which a very large amount of time, and labour, and capital, had been expended should be preserved to the use of the inventor for a certain time before the public had the benefit of it. It certainly seemed to him that to defer for a time the enjoyment by the public of the fruits of intellectual labour, employed in important experiments, producing discoveries of much value, was not unjust to the public, and did not obstruct economical progress, and this plan possessed the recommendation of graduating the reward by the extent to which the invention was usefully employed. He would only add that the wondrous extension of our manufactures and commerce during the last ten years would seem to show that, whatever other effects might have resulted from the law of patents, it had not hindered the growth of national wealth. He would now, in the name of the meeting, express to Mr. Webster their warmest thanks for the able paper which he had read, a paper which was exceedingly moderate in its tone, and which had therefore brought the subject before them in the best form for consideration.

Mr. **Webster** said he felt very thankful to the meeting for the way in which they had received the chairman's proposal of a vote of thanks to him, and he would take the opportunity which was now afforded him of making a few observations on some of the points which had been raised in the discussion. He would say at the outset that he really felt very great satisfaction in bringing this subject before the Society after a long interval. It was now some twenty years since it was first brought under the attention of the Society, and he believed that much good would result from the discussion which had just taken place. The discussion was certainly a very exhaustive one, and there was hardly a single point which had not been raised. There was no doubt at all that there were very great inconveniences in the present patent law system, and the cost of litigation itself in connection with it was a scandal to the country, though he admitted that this was a matter with which a strong hand could deal. He would not go into detail on legal matters, but there was one point to which he would just refer, and that was that it had been decided that the user of a machine under any circumstances might be liable. That decision, however, had been doubted by a very great authority, and he thought that it was a matter which ought to receive very serious consideration. There was also another question, as to how far a person who was merely the possessor of a patent ought to have the privileges of a patent law extended to him. They all knew how the matter had been dealt with by the present Lord Chancellor; but these were questions which deserved the greatest attention, and if the suggestions which had been made during the discussion were carried out, it would certainly be a step in the right direction. He could only repeat what he had said before, that he did not believe it was expedient to grant patent right as a matter of course. Lord Stanley, in a discussion which was held some years ago, stated that he conceived the only patent right was a right to bring an action, which right should not be granted as a matter of course, and if this were more borne in mind, much of the present opprobrium would be removed. With regard to the appointment of a tribunal for adjusting the rights of the public and of the inventor, there was no doubt that it was a matter of extreme difficulty, and he thought that Sir Edward Belcher and Captain Selwyn had really disposed of that question, and he himself believed that it was impossible for any board of experts to value an invention, which was a matter to be left to the public alone, and then, after the public had valued it, they would find men coming forward to purchase it at its value. He was very glad indeed to see their old friend Mr. Macfie, who had been for so many years a staunch opponent of the present system, though not of the rights of inventors, because he must do him the justice to say that, although he had spoken very strongly on the subject, he had yet always been the consistent advocate of licenses. With regard to what Mr. Winkworth had observed about what Mr. Brunel had said as to the soap trade, he only wished that Mr. Brunel were present, and then he would have asked him which he had found to be the greatest obstruction to the soap trade, the excise or the patent laws. There, in the excise, they had an instance of the most scandalous abuse in restricting invention. It was almost blotted from the statute book, and he hoped that it would soon be abolished altogether. Another topic of some importance had been referred to by some of the speakers, one of whom had asked whether, in order to prevent the taking out of a patent by some one else, he was to advertise his invention in the newspapers. No, certainly not; but he could do this:—on the payment of a small fee (and he wished it were less) he could record his invention at the Patent Office in the shape of a provisional specification. That was one of the objects of the new patent law, to provide a means of recording inventions. It was no doubt a very great hardship for a man to make an invention and after a time to abandon it, and then find afterwards that somebody else had taken out a patent for the same thing, and that he could not use his own invention without being put to a great deal of trouble and expense in litigation. It must be remembered, however, that the patent law did not so much reward the inventor because he was an inventor, but the man who gave the public the benefit of the invention; and this was recognised in the fact that patents were granted to the importers of inventions, the policy of which entirely rested upon this principle, that this was for the good of the public, and for that reason the man was rewarded, and not for being the successful inventor. If the matter was looked at in this view, it would be seen that it was out of regard to the public benefit that the reward was given. Professor Wanklyn seemed to conclude that, because science was not rewarded as it ought to be, therefore the practical arts, as developed in inventions, ought not to be rewarded, but that certainly was no valid argument against the system. He wished the meeting particularly to bear in mind the distinction which he had pointed out the other evening between an inventor and a discoverer, and he utterly denied that there was any analogy between the cases at all. With regard to preliminary examinations, there was a great difficulty in knowing what one single step might lead to, as an inventor was very often before his age. He had referred, in his paper, to the fallacies into which some persons fell, in connection with this subject, and he thought that Mr. Hastings had fallen into an entire fallacy in what he had said about territorial grants, because the fact was that it was altogether a false analogy. In the matter of discovering a new country it was entirely a question of first occupancy, which was the basis of all holding of property; that was merely discovering what was in existence before; but in a patent a thing was created which did not before exist, and for that a reward was given. An allusion had been made to Dobbs's case, and he was glad to have an opportunity of mentioning it, because he thought it was an illustration of the advantage that would have resulted from a preliminary inquiry, inasmuch as if such an inquiry had taken place all the litigation would have been avoided. If a preliminary inquiry were held at an early stage the inventor would not have to go on blindfolded, as he did now, but if he went on after he knew the real state of the case it would be on his own responsibility. With regard to the annual payments, there might be difficulties in the way, but the periodical payments had been very serviceable, and he had no doubt that yearly payments would be found to be the same. He had only one other thing to mention, and that was with respect to the screw-propeller, which, but for the patent laws, never would have been started. The Archimedean Company established it under the operation of the patent laws, and hence its success. With these observations he would again thank the meeting for the manner in which they had entered into the subject, and he hoped that much good would result from the discussion.

Mr. Henry Cole, C.B., writes to the Secretary as follows:—

At the adjourned meeting of the Society to discuss the Patent Laws, I request that you will have the kindness to read this letter as a substitute for my presence. I feel it somewhat of a duty not to be silent, having taken an active part years ago in promoting the reform of the Patent Laws upon the principles sanctioned by a Committee of the Society, whose three published reports I was entrusted to prepare.

1. In 1849 a numerous Committee of noblemen and gentlemen[*] was appointed by the Society to promote "Legislative Recognition of the Rights of Inventors." The opening paragraph of the first report of that Committee was as follows:—

"1. A British subject has no rights of property whatever in that intellectual labour which produces invention or scientific discovery, excepting such as he can obtain by petition from the Crown. He may have bestowed years of mental exertion and manual toil in perfecting a discovery most beneficial to mankind, still he is not in the position of being able to claim even the recognition of the fruits of his labour as his own. He must become a petitioner for the right to the Crown, which is absolute and irresponsible, and may refuse it without any power whatever of appeal. Many and well-settled as are the rights of British subjects compared with those of other nations, the suppliant inventor has no rights of his own in his invention.[†] The inventor in France, in America, in Holland, and in Belgium, even in Austria and Spain, has his rights recognised by declared law; but the Englishman has none. By passing through a series of formulas, so antiquated that the origin of them is lost in the obscurity of past centuries—so empty and frivolous, that common sense revolts at them—so numerous that they can hardly be reckoned accurately—so intricate, that every one seems a pitfall to discourage scientific invention to the utmost—so inexplicable, that the greatest diversity of opinion obtains in interpreting them—so costly, as to place scientific intelligence wholly within the power of capital; an inventor may at last obtain a mere recognition of his right, which he is then at liberty to protect as he may be best able."

2. This Committee brought before the public, for the first time, a recital of the thirty-five stages which it was necessary, at a cost of about £100 in fees only for England, to pass through to obtain a patent; and Mr. Charles Dickens, in a most humorous paper, entitled "A Poor Man's Tale of a Patent," in his *Household Words*, described how one Thomas Joy had perfected a model, and wanted to patent it; came to London; petitioned Queen Victoria; declared before a Master of Chancery; went to the Home Office; got his petition signed by the Home Secretary; took it to the Attorney-General; paid four pound four; "Nobody all through ever thankful for their money, but all uncivil;" back to Home-office; got a warrant; sent to the Queen; Queen sent warrant back; Home Secretary signed again; went to Patent-office for a "Draft of the Queen's Bill" and a "Docket of the Bill;" two copies engrossed, one for Signet-office, one for Privy Seal-office; engrossing, stamping; again to Attorney-General; again to Home-office; again to the Queen; then to the Signet office; then to Lord Chancellor; then to Privy Seal; then to Clerk of Patents; then fees to Lord Chancellor's Purse-bearer and to Clerk of Hanaper, and to Deputy Clerk of Hanaper; again fees to Lord Chancellor; and lastly, fees to Deputy Sealer and Deputy Chaff Wax! Pleasant processes to numerous interests—law and others. All this rubbish the Society cleared away.

3. The Great Exhibition of 1851 gave a great blow to this antiquated system, and a special Act of Parliament was obtained which enabled inventors to exhibit without the intervention of Hanapers and Chaffwaxes. Then a Committee of inquiry in the Lords sat, and an Act was passed, based upon many of the most important principles advocated by the Society, and in accordance with the practice more or less adopted by other European countries and the United States. I need not describe them; they are stated in the third report of this committee.

4. There has now been ten years' experience of this Act, and everybody, without exception, advocates the amendment[*] of the system; as Mr. R. Wilson said in his excel-

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[*] The Committee consisted of the following:—The Marquis of Northampton, the Earl of Radnor, Sir John P. Boileau, Bart., Sir J. J. Guest, Bart., M.P., the Right Hon. T. Milner Gibson, M.P., Henry T. Hope, Esq., M.P., Samuel M. Peto, Esq., M.P., Sir James Anderson, Glasgow, George Brace, Esq., Henry Cole, Esq., Charles Dickens, Esq., J. H. Elliott, Esq., John Farey, Esq., C.E., P. Le Neve Foster, Esq., M.A., Charles Fox, Esq., C.E., Wyndham Harding, Esq., C.E., Edward Highton, Esq., Capt. Boscawen Ibbetson, K.R.E., Owen Jones, Esq., Herbert Minton, Esq., the Potteries, R. S. Newall, Esq., Gateshead, Dr. Lyon Playfair, F.R.S., Richard Prosser, Esq., Birmingham, Dr. J. Forbes Royle, F.R.S., W. W. Rundell, Esq., Falmouth, Archibald Slate, Esq., Woodside, Dudley, J. Jobson Smith, Esq., Sheffield, Professor Edward Solly, F.R.S., Robert Sutcliffe, Esq., Idle, Leeds, John Sylvester, Esq., Arthur Symonds, Esq., Professor Bennet Woodcroft. Secretary—George Grove, Esq.

[†] "There is not any clause or enactment by which the subject can demand them as a right. This great encouragement to industry, this fruitful source of wealth, is still the free gift of the Sovereign. It emanated from Her Majesty, as the patron of the arts and sciences, at the humble request of her subjects; and it is as a gracious favour that she extends this royal protection to the inventor."—*Godson on Patents*, p. 21."

[*] The following were the heads of a Bill recommended by the Society in 1852, and it will be seen that many of the evils now complained of would not have existed had the recommendations been fully adopted.

RESOLUTIONS PASSED TO FORM THE HEADS OF A BILL.

1. That everything in respect of which a patent may now be granted should be registered.

2. That the benefits afforded by Registration should extend to the United Kingdom of Great Britain and Ireland, and the Channel Islands.

3. That the Registration should be considered merely a record of claims, and not as any determination of rights betweeen parties.

4. That it should be competent to any Inventor to make disclaimers and to rectify errors in his Specification at any period.

5. That Registration of Inventions should be obtainable for a period of one year on payment of £5, and should be renewable for four periods of five years each, on payment of £10 at first renewal; of £20 at second renewal; of £50 at third renewal; and of £100 at fourth renewal. [The principle of renewed payments is proposed as a means of testing whether an invention is in use, and of removing useless inventive rights that might otherwise be obstructive of improvements.]

6. That there should be penalties for using the title of "patent" or "registration" where none has ever existed.

7. That the present tribunals are insufficient for the trial of subjects of design and invention.

8. That it should be permitted to commence actions for infringement of the rights of Inventors in the County Courts.

9. That inasmuch as, contrary to expectation, very little litigation has been created by the rights conferred by the Designs Act of 1842 and 1843, this committee is of opinion that a fair trial should be given to the working of the proposed system of Registration of Inventions before any special tribunal to determine inventive rights is substituted for the existing tribunals.

10. That any tribunal before which proceedings are commenced should have power to refer any case for report and certificate to the Registrar, assisted by competent and scientific persons.

lent and practical speech, "Either improve this system or give up the patents altogether," whilst there is a strong and growing party which desires its repeal and the abolition of patents. A commission, consisting of legislators, lawyers, and others, are investigating what is to be done, and, appropriately enough, the Society again discusses the subject.

5. Certainly the problem is most difficult, and not to be hastily solved. It is easy, if you are convinced, to say, "Away with all patents, and no monopolies; leave manufactures alone and to manage for themselves;" and I confess I find myself inclining more in that direction than towards tinkering at minute administrative legal details.

6. Yet, on the question of principle of patents, I hesitate to say confidently that Adam Smith and Bentham, John Mill and others are in error, and that the practice of other countries is wrong. But the discussions which have taken and are taking place, as well as the experience of the last ten years, make, to my mind, some things in this matter quite clear. I have no interest whatever in any patent. I claim to have been a reformer of the old patent laws. I am not a patent agent or a lawyer, and I think I am quite unprejudiced and dispassionate on this subject.

7. It is clear to me that copyright in authorship or artists' work is quite distinct from patent right in invention, or the "first finding" of a thing. Minds, however alike, dwelling on the same thoughts, could never utter them or represent them in the same way identically. Mr. Webster says, "the subject of copyright is one specific combination of words, letters, and lines, in this respect similar or analogous to the specific combination constituting a machine. The fallacy of this is apparent when we put Shakespeare and his "Hamlet" as "similar or analogous" to W. E. G. and his "Ærial machine," or R. D. and his "Hair brushes rotatory," or W. C.'s "Lubricating apparatus," as registered in the Society's last *Journal*. But inventors seeking to find a something would most probably each one find that identical something at the end of their race. They are like huntsmen—Reynard is there—somewhere—and the first seizes the brush, which the second or third might have got by happy accident.

8. It has been hitherto held to be good public policy that the first finder shall have a limited monopoly of his invention against other seekers and finders, on condition of his honestly making it fully public.

9. Everybody agrees that the finder does all he can not to keep this part of his engagement. His specification is made as dark as possible. Can you compel him to make it clear and definite? Perhaps so, but it is difficult. Perhaps a public registrar might usefully be appointed to determine if the inventor did or did not state in a given form, clearly and unmistakably, what his invention was?

10. I am opposed to Mr. Webster's opinion that "Patents should *not* be granted as of course, but some check be placed on their indiscriminate issue by a preliminary inquiry and report." I don't wish to see a Pope for patents, or any compulsory tribunal attempting to decide if the invention be one or not. I doubt its competency and authority. I am sure it would give little satisfaction, and certainly an appeal against its decision would have to be allowed, which might be good for lawyers, but certainly not for inventors. The onus of the proof of the invention I think must rest solely with the inventor. Like all other possessors of rights, the inventor himself must defend his own if he care for it.

11. One great merit of the existing law is that it extinguishes frivolities. Mr. Hawes has shown that out of 3,000 patents, only 100 sought to exist for seven years. "Only 100 out of 3,000 are worth £100 at the end of two years."

12. If it be determined to maintain the principle of a Patent Law, then the preservation of this principle of successive stages seems to me most important, but I think the time of duration of the right as well as the cost should be greatly reduced.

13. Let the "first finder" or inventor have a right of registering that he claims to be so. Compel him to register his claim as distinctly as possible. Allow of no evasions. Pay a public officer to keep him up to the mark. Allow his claim to stand good for twelve months and no longer. This period, I think, would be sufficient to enable him, not, perhaps, in some few cases, to *perfect* his invention, but to keep a-head in the market of other claimants, and to find, if necessary, the capital to go on with it; for it is generally admitted that the first finder has to find, besides his invention, the capitalist, who works the thing found. As Dr. Collyer said—"Men who had money did not, as a rule, devote themselves to invention."

14. It may be said that so short a period of monopoly is not long enough to attract capital. I don't believe it. Capital will obey the usual laws of self-interest, and it is not requisite that Parliament should give it monopolies or protection. It can take care of itself.

15. It has been proved, I think, that no very great discoveries can be traced to the monopoly granted by the Patent Laws. They go on quite independently of charters or legislative laws and such like artificial conventions. I have arrived at the belief that the progress of inventions, either great or little, would not be arrested in the slightest degree if Patent Laws were abolished. Philosophers don't want the monopoly. Competitors for "first findings" may—and it may be right to give it, although it is admitted that the monopolies granted lead incidentally to great nuisances, undoubtedly hindering other competitors.

16. The question resolves itself to this. Is it right public policy to encourage first finders or inventors to hunt for things? to register publicly such findings, and, in return for such public registration, to acknowledge their claims to a right to the "first find" for a very limited time? and I come to the conclusion that under present circumstances it is. Such policy may lead to the abolition of even the very limited monopoly proposed. If it do, it will be an easy transition—better, I conceive, than a violent and absolute revolution, like the total abolition of patents. If it do not, then the limited monopoly will remain, in accordance with public convictions of its public utility, but very limited in duration. The right of monopoly should, I think, be obtained easily, and at a cost sufficient and no more to pay the expenses of a proper registration. Experience has shown that the present fees are merely a tax, which has not even yet been applied to erecting a creditable Patent Library or Museum for Inventions, things of great value and public interest apart from the policy of patents.

Mr. W. BRIDGES ADAMS writes:—

A strong effort is now making, by a small but energetic body of persons, against the continuance of the patent

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11. That upon the illegality of the Registration being established by the judgment or order of any competent tribunal, the Registration be cancelled.

12. That there should be only one office for the transaction of business connected with the Registration of Inventions, and the payment of fees in respect thereof.

13. That every person desiring to register an Invention should submit two copies of the Specification of his claim, accompanied, in every case where it is possible, by descriptive drawings.

14. That the mode and procedure of Registration should be regulated by the Board of Trade, subject to a report to Parliament.

15. That an annual report of all Specifications registered, with proper indices and calendars, should be laid before Parliament.

16. That a collection of all the Specifications should be made, calendared, and indexed, and deposited for public information in the British Museum.

17. That it is highly desirable that such a collection should be printed and published.

18. That the surplus profits, after paying office expenses and compensation, should be directly applied to some public purpose connected with invention, but not carried to the Consolidated Fund.

laws, on the ground that they are injurious to the general interests of the community. Could they make out their case it would be quite right that the laws should be abolished, for the interests of a small body of persons, such as inventors, must give way to the general interest. It has been long conceded that individual property in matter is a general advantage, much more so than possessing matter in common. It could not be tolerated that large estates should be the property of individual owners save by the conviction that this ownership produces on the whole a larger usufruct for the general benefit. Nor would the owners of these estates portion them out in farms of greater or less size save from the conviction that by individual skill and possession they reap a larger rent. Were it not so the land would be all in common and uninclosed. Every man in the community seeks as far as he can to obtain a monopoly of all the things he desires, and so the landlord has a monopoly of his estate, and in the farmer of his farm, and in the miner of his mine, and in the millowner of his mill, and so on through all the various conditions of propertied life. But that which gives the highest value to matter is mental ideality. Without this we should be mere clods—of the earth, earthy. Our talk would be of beeves, and we should scratch the earth's surface skin deep, as most half-savages do, to get a scanty crop of grain and roots. To make mental ideality fructify and constitute public utility, we must do by it as we do by matter, give it individual ownership and enclosures, not mock but real. For though it is quite true that even as unenclosed land will produce a wild crop, so will unenclosed mentality, but the value will be in the same proportion that rye grass bears to wheat of the highest standard. Men of mark and cultivation, and consecutive mental industry, will not sow that others may reap the harvest. They will either keep their ideas concealed, or they will set their investigating faculties at work to ascertain why, if the ideas of the brain are to be made common property, matter also should not fall into the same category? It is quite clear that the inventor has no inherent right in his invention beyond keeping it a secret, and that he can only turn it to his own profitable account by the agency of the community, who are to use it directly or indirectly, for if there were no community his invention would be valueless. His advantage and that of the public must advance with equal steps, and it is for the public who grant the right to consider whether, upon the whole, it is not more for their interest to protect and help these inventors than to thwart and starve them. Inventors proper are not numerous; even the patentee list—and far be it from us to assert that all patentees are inventors—the patentee list falls far short of the booksellers' list of large and small poets and rhymesters inclusive. They rank with, and are a part of, the original-minded men who have the perception of truth and beauty and analogy in all things—thought, language, sound, form, colour, and structure. In virtue of their instinctive and not mere imitative properties, they are men of genius who direct their fellows into new tracks, and constitute the great distinction between the English nation and the Chinese. Poets, bookwriters, painters, sculptors, musicians, chemists, and constructors, all fall into the same category, and are all represented by matter, and the nation may, if it chooses, deprive them of the right of property in their own creations. The poet and bookwriter gather their royalties from the manufacturers of books, or may print themselves exclusively. The painters and sculptors gather royalties from the multiplication of their works in casts and engravings. Musicians gather royalties on the sale of their measured notes represented in print, and there is no more justice or policy in shutting out the constructor and chemist from their royalties or their originalities, than there would be in throwing open the writings of Kingsley, Dickens, or Tennyson, to the voluntary contributions of Paternoster-row. We do not wish to use the *argumentum ad hominem*, but, nevertheless, we cannot accept the arguments of interested men against patent laws, which act as a curb on their desires to possess a capitalist monopoly. They profess a desire to see inventors rewarded without patents, but they do not tell us how this is to be done. Is to be by Parliamentary grant? How then is the inventor to be defined if there is no record of his invention, no making it patent? Is he to enter into a squabbling and canvassing contest with loud-tongued, unscrupulous pirates, and canvas the members for their votes? This would be to make it a matter of politics, like a contested election, in which the retiring student would have no chance against the brazen and unscrupulous man of action. But, say the opponents of patents, there is an injustice in giving an exclusive privilege to a man to-day for that which another man might invent to-morrow, or next day, or a month after. Similarly so might it be said, that it is an injustice for a duke to possess an estate which might next day or week have become the property of an earl had he not been forestalled; or, that it is an injustice for England to possess New Holland, which might otherwise have become a possession of France. We cannot see the injustice that a man who is up and doing should take possession of that which had before his time no owner, and is in fact a creation, or pro-creation of his own. There has been much talk about the absurdity of many patents, and how few of them are of any value, while they are obstructive to inventors, and that it is necessary to sift them by a preliminary examination? Do people really understand what this means—that a man's secret—his invention—shall be canvassed and discussed, and the patent given or withheld at the option of the examiners? Is it possible to remove from a sanguine man's mind the idea that some wrong motive has been at work, that nepotism has refused to him what will be granted to some friend of an examiner. Warn the man, if it be needful, but give him his patent if he persists, and after he has specified, put it on trial, in full court, and expunge it from the records for sufficient reason. The man will then have justice, and the patent lists will not be damaged. Assuming that patents are useful to the public, as tending to make men work earnestly and consecutively at new things, it becomes necessary to ask what should be a good and fitting subject for a patent, and what not. What is novelty? It is an old saying that "there is nothing new under the sun." As regards the public everything is new that has not been in use for a generation, and the fact that a thing has been recorded without being used should not invalidate an inventor from turning it into use under the protection of a patent. If a thing has disappeared from public use for the space of thirty years it would be a positive advantage to the public that an inventor should have a patent—a mental enclosure—to induce him to foster it and give it a new birth. Still the outcry is of "monopoly," the cuckoo cry of free trade, as though there were any opponents of monopoly so strenuous as the inventive men, as though the whole world would not be a monopoly save for these beaters down of the old ways. The true monopolist is the capitalist, and man in possession by virtue of his position. He may allege that he is open to competition, but this openness is only in the sense that the doors of the London Tavern are open to all customers who have money in their purses. In competition the race is to the rich, and the poor competitor is hustled off the ground. Let an inventor without a patent bring to bear any improved article in large demand, he will infallibly be competed with, and displaced by, the larger capitalist, whose small profit on a large return will leave no profit at all to the man of small return, who, perchance, has expended all his means in perfecting the new article. But if he be protected by a patent, the inventor can hold his own till he himself become a capitalist too strong to be damaged, unless ruined by processes on the part of the capitalist, owing to the defective state of the law. It is the inventor who breaks down the would-be monopolies of capital; and other competing inventors, also, in their turn, break down the monopoly of the first inventor. They do not debar the capitalist from his rights to compete in his accustomed fashion, but only to compete in the inventors' brains and new uses. Many prominent persons there are whose opposition to patentees is grounded on a case of defeated piracy, or in a desire to prevent all others but themselves from rising to eminence. This patent record and protection is the only fulcrum by which the inventive non-capitalist can lift himself to a level with the capitalist manufacturer, and disturb the stagnation which would else prevail. The competition of manufacturers is for quantity, not for quality. The inventors generally cheapen as well as improve—they substitute machines for human drudges, with far better results in quality. To attempt to reward inventors by grants is the merest moonshine. The reward would never get to the true inventors, but would be intercepted by the jobber; for the student qualities that constitute an inventor are not the qualities that canvas the attention of governments or government authorities. Even were it not so, how is the money value of an invention to be estimated? Only by its pecuniary success, giving an exclusive right to the owner, for a longer or shorter period, to manufacture or use himself, or to licence others so to do. But there is another argument used by the manufacturers which has a groundwork of reason; they allege that they can compete, on favourable terms, with all the world in manufactures, but that a patent in England, when there are no patents on the Continent for the same thing, puts them at a disadvantage with the foreigner. For example, the rise in price, and, probably, in profit, on English iron, enables Belgian iron masters to compete in the market of the world, subject always to the condition that the English iron-masters can underbid them if very troublesome. But, if upon any article, rails, or others, there be a patent right in England and none in Belgium, they must remain at a disadvantage. What does this amount to? That they seek to monopolise the iron manufacture, and, therefore, they should establish themselves in Belgium or they should take the Continental patents for the invention, and so guard themselves. Anyhow, we do not see why their interest should be studied in preference to that of the inventor if they do not choose to help themselves by helping him. "But the patent law," say they, in a sudden accession of care for the interests of the inventor, "is a mockery, a delusion, and a snare to the inventor; so let us abolish the law." We may paraphrase it thus—"The law of freehold in land is a mockery, a delusion, and a snare for the landholder, for it exposes him to be ruined in Chancery; therefore, let us abolish the law of freehold." I think that it is far better in the interest of the public to amend the law, and I would do it after the following fashion:—1. I would define novelty to consist in the fact that the thing patented had not been in use in England for a term of thirty years previous to the application. 2. I would have an applicant warned by the proper authorities that his application was for an invalid thing, but give him time nevertheless to record and specify, on the ground that no examiners should be entrusted with a power to refuse an application for reasons which might be insufficient or possibly interested. But as soon as the specifications were lodged, it should be put on trial in open court at the cost of the community, and erased from the records for good and sufficient reasons, removing a stumbling block, or expunging any part of it required. 3. That all new and original things in a patent for any specific invention should convey a right to their use in every manner, *i.e.*, a new thing specified in an improvement for one machine should be applicable to every variety of machine, and an inventor should not be obliged to take two several patents for a gun and shot, or for wheels and rails. 4. That the patent should be renewable as a matter of course if the inventor, from no fault of his own, but from difficulty of introducing it, had failed to realise a certain rate of profit to be determined on. 5. That all trials as to patent validity, constituting it a property or otherwise, should be before an especial patent court, whose favourable verdict should be essential to patentee litigants before going into a court of law to obtain damages. We do not think that the tendency of disinterested public opinion is against patents, but the contrary. The chief opponents are those who wish capital to be individual property and brains common stock. The patent is the trade mark of the inventor, and if that be taken from him we trust that the trade marks of the manufacturers will be thrown open at the same time, for these trade marks, earned by long and hard work, are as much a monopoly in the market as the patent earned by the long and hard work of the inventor, for if one trade mark may compete with another, so also may one patent compete with another. We should like to know of what kind is the reward proposed by Mr. Hawes for inventors? On him has descended the mantle of his relative, the late Mr. Brunel, and it is upon the records of the committee of the House of Commons that Mr. Brunel's idea was that all inventions were made by workmen, and that a good master would reward them well,—one pound sterling for an ordinary invention, and five pounds sterling for something extra good. Mr. Hawes's definition of the distinction between copyright and patent right is hardly logical. What does copyright mean but the exclusive right to manufacture a particular book, and what does the patent right mean but the exclusive right to manufacture something else—the book originating in one brain and the something else in another. Invention is essentially forethought—a grapple with the future. Contrivance is afterthought—a patch upon the present, but the contrivance coming into an existing market is always better paid than the invention, and the inventor is frequently sneered at as being before his time. But for all that, it is the inventor who changes the face of the universe for the better, and lessens the drudgery of humanity, and adds to its resources and pleasures, while the capitalist and contriver reap the profits. It will be an evil day for the world if ever the counsels of Achitophel shall prevail to the starvation of originators. Nor do we see the justice of compelling the inventor to licence his rivals who may be interested in damaging his plans by bad workmanship, and over whose dealings he can have no satisfactory control. Some years back there was a humorous illustration of this practice. An umbrella maker advertised "the best silk umbrellas from 7s. 6d. upwards," and then added, with a vindictive animus against Sangster, from whom he had been compelled to take a licence, "N.B. A parcel of ugly alpacas on hand." Meanwhile the clear brain of the Lord Chancellor is getting in the thin end of the wedge, and his efforts will, doubtless, culminate in an Inventors' Court of Equity, for the legalisation of mental title deeds, at the cost of the Accumulated Patent Fund.

Mr. Edmund Hunt writes:—

Referring to the discussion on the 20th inst., I think it is a pity that, in order to avoid confusion, separate occasions were not chosen for dealing with the two great sections of the subject:—The question whether legal protection of inventions should be retained or abolished? and the question, whether the existing patent laws could be improved, and how? As to the first, I would ask whether protection should be retained from principle or from expediency? I think the only sound arguments in its favour are those grounded on expediency; and if so, what may be expedient now may not be so ten years hence. Ten years ago I was enthusiastically in favour of patents but unusually good opportunities for studying the subject, and for general observation thereon, have brought me gradually round to the firm conviction that the time is not far off when it will be better, both for the inventor and for the public, for patents to be abolished. But I must by no means be ranked with certain recent agitators against the patent laws, for I believe the very injudicious and faulty character of their arguments will have the practical effect rather of retarding than of hastening the abolition of patents. I do not, however, think that patents will be abolished at present, and it would therefore be a waste of time to enter very fully into this branch of the subject. And although I hold opinions against the future expediency of patents, I do not suppose I am, on that account, the less likely to have sound views as to the practical defects of the existing laws and their remedy. As to definitions, which, as was truly observed, are of great importance in a discussion of this kind, I would call that a non-patentable discovery in which we find out how two things have been combined, or have acted on each other; and that a patentable *invention* in which we combine or make to act together two things which, as far as we are aware, never before were so combined or made to act. In the strict sense of the terms the human mind is utterly incapable of creating or originating even ideas. It receives its materials from without, and simply re-arranges them, and that not after any new plan, but in more or less close imitation of arrangements it has seen. A great many frivolous remarks are often made in discussions of this kind, about patents for frivolous things. If the things referred to are really frivolous, how can the public possibly suffer from their being patented, seeing that no one is bound to buy or use a thing because it is patented, and that no one will buy or use a thing that is, in his opinion, frivolous? The patentee is the sole loser, namely, of his time and trouble, and of the cost of his patent; but it is useless to tell him it is frivolous—he knows better. Obviously the moment anything becomes useful and is wanted, it ceases to be frivolous. All plans for dealing with the merit or value of inventions, in anticipation of their use, are utterly impracticable. I also consider it impossible for a board of examiners to deal satisfactorily, in all cases, with the question of novelty. The American system has not worked satisfactorily. But it is certainly not right that when an inventor pays Government for documents ostensibly giving him a certain protection, his payment should be received as for a *bonâ fide* protection, when there exists in the government office the means of knowing that, in many cases, it is worthless, from protection having been previously granted for the same thing. It is like obtaining money under false pretences. The remedy is, in my opinion, to employ a staff of examiners and searchers, who, as soon as possible after the receipt of every application for a patent, with a description of the invention, shall compare the same with existing patents and other records, and shall draw up a report, stating in what cases the invention appears to have been in any way anticipated or even approached. This report should be delivered to the applicant, and it should be left to himself whether to complete his patent or not; whilst, to prevent parties from imposing on the public by completing their patents, in the case of the inventions being old, and in face of the reports to that effect, such reports should be accessible to the public, and be printed along with the specifications. Surely a patentee is entitled to receive for his freely-paid fees a return such as the information contained in the report would be. In this plan I thus propose to adopt the good features of the American system, without the faulty feature of the arbitrary power of refusing a patent. But I believe that what would be found in practice to be the most advantageous alteration the present Patent Laws are capable of, would be to enact that the public use of an invention by the inventor or in imitation of him, for a period previous to his applying for his patent, should not invalidate such patent. In our own Indian Patent Laws twelve months are allowed, and in the American laws two years; and in America this provision has proved itself to be most valuable. At present in this country patents are taken out for a great number of things which prove impracticable or useless, but which, if the suggested alteration were made, would have been tried before it became necessary to apply for a patent. On the other hand, a great number of valuable improvements are continually being made without patents being thought of at the time, and afterwards when practical and recognised success suggests a patent, the inventor finds his publication of the improvement has debarred him from getting a valid one. With the alteration suggested, patents for such really valuable improvements would take the place in the lists of the class of useless ones previously referred to. The difficulty about compulsory licences arises from inherent defects inseparable from any patent system. Although, in consequence of existing prevalent ideas, but which have been fictitiously induced, a patent holds out a certain amount of encouragement to an inventor, it is still certain that it is often obstructive to improvement. Mr. Webster's challenge to cite cases of obstruction is ingenious; but numerous examples could easily be detailed; in fact, the larger portion of patent trials for infringement are due to it. The encouragement patents afford is measured out in doses not to be exceeded; and progress must take a stride only once every fourteen years! But it is said compulsory licences would obviate the obstructiveness of patents. They might, and have other advantages also, if a satisfactory system could be suggested. Has a practical system of compulsory licences ever been suggested? I think not. It would obviously not do for patentees to fix their licence rates without some check to prevent their being so high as to be prohibitory. I don't think the machinery of arbitration at all suitable; and any patentee determined to be obstructive and having the means could easily delay a settlement, or make it the starting point of interminable litigation. A plan which would make it against the patentee's interest to charge too high a rate would be most likely to work well; but no way of embodying that feature has occurred to me but one, which I fear is too complicated, and involves too much change in the general system of patents. I would reduce the fees payable on obtaining a patent to those barely sufficient to cover office expenses, but patentees should pay a tax on realised profits, to be fixed in amount in the following manner. Every patentee should advertise his rate for granting licenses, and at regular periods give in returns of the number of machines sold or equivalent particulars, and of licences granted, and he should be taxed on such returns at rates corresponding to his own licence rates; so that the higher he fixed his rate the larger would be his tax. The preliminary fees might also be deemed to be a payment in advance to account of the periodical taxes. The following enactment is loudly called for, namely, that every patentee shall affix the number and date of his patent on every article made under it; and a penalty shall be exacted from any one using the designation "Patent" without having a patent. It is very remarkable that whilst in the case of designs such an enactment is in force, the laws of patents, of so much greater importance, are without it.

Mr. Harry Chester writes:—

On Wednesday last I was, and on Wednesday next I shall be, unable to attend the meeting for discussing the Patent Laws. *Tempora mutantur nos et mutamur in illis.* I remember that, in 1854, the opinions, or (should I say?) the feelings, of those who attended our meetings were commonly in favour of patents and even of our present Patent Laws. Now everyone gives up the latter as mischievous, and many are altogether opposed to the former. Regarding the patent system as one of the worst of lotteries, wherein the blanks bear a higher proportion than usual to the prizes, I think that the Society, while it promotes improvements of the system, so as to minimize its evils, should set itself to consider whether any substitute can be invented for the encouragement of inventors, or rather, I should say, for the honouring of great inventors. It seems to me that, while we have orders of merit for the reward or acknowledgment of great statesmen, diplomatists, lawyers, and military and naval heroes, we want an order for the acknowledgment of the merit of great heroes of invention in Arts, Manufactures, and Commerce. I do not pretend to indicate in detail the conditions under which such an "Order of Inventors" might be useful.

I think the Society might appoint a committee to consider the subject; and I will only add here that it seems to me that it would be essential, first, that no award should be made in respect of any invention which had not been in use for a sufficient number of years to allow public opinion to be ripened in respect of it; and, secondly, that, in special cases, of great merit or need, a pecuniary recompense from public funds should accompany the grant of the order to the inventor, or to his heirs, or to both himself and his heirs.

Proceedings of Institutions.

ABERDEEN MECHANICS' INSTITUTION.—The sixth annual report states that in the science school the numbers who entered the different classes were as follows:—Mathematics, 24; mechanics (theoretical), 15; chemistry, 30; botany (winter session), 5; ditto (summer session), 10; total, 84. As compared with the former year, this shows a falling off of 35—there being a slight falling off in each class, except in that for mechanics—the greatest being in those for botany and mathematics. As to the natural history classes, the directors feel that these have failed in securing anything like adequate encouragement. With the exception of the junior class for mathematics, these classes were examined as usual by the examiners of the Science and Art Department, when the class for theoretical mechanics obtained two second and two third class Queen's prizes, and one student "passed." The class for chemistry, two second and two third class Queen's prizes, with one "honourable mention," and five students "passed." In systematic botany, and in vegetable physiology, one student gained "honourable mention," and one "passed." The school of art remains, in regard to numbers, very much the same as in the previous year. During the year, 140 students entered the class for males; 54 that for females: and 12 the day-class—making a total of 206. The average monthly attendance has been—male evening class, 53; female evening class, 28; day class, 7—total 80, or exactly the same as the previous year. Besides the students of the central school, just enumerated, various other schools are reported to have been under instruction in connection with the school of art during the past year, the number of pupils being 700. This shows a falling off of 220 pupils, which may probably be accounted for (says the report) by the unsettled state of matters and apprehensions caused by the application of the "Revised Code" to Scotland. One of the students carried off a national medal, which entitles the school to works of art of the value of ten pounds. Two others received "honourable mention." At the usual local examination by the Government Inspector twelve local medals were awarded, entitling the school to six pounds worth of works of art. Fourteen students of the school were "passed" in the second grade of examination in practical geometry and perspective, and in free-hand and model drawing seven obtained the mark "excellent," and three of them were awarded prizes. In the trade evening school the following are the numbers who joined and attended any time during the year:—Junior English class, 24; senior class, 15; French class, 32; German class, 9; English history class, 6; writing, arithmetic, and book-keeping classes, males, 201, females, 30; total, 317. Two of the above—those for German and English history—were new classes. The report notices the generous conduct of an employer of skilled labour on a large scale, Mr. Macdonald, of the granite works, who sent thirty of his apprentices to classes of the Institution, and paid their fees. With regard to the library, the quarterly verage number of readers during the past year has been 818; the number of volumes issued has been 23,088; nd the total ordinary income, irrespective of donations, as been £230—being an increase. as compared with the previous year, of 292 in the number of readers; of 4,620 in the number of volumes issued; and of £31 in the ordinary income. The number of volumes added to the library during the year is 1,354; the total number being 9,809. The balance sheet shows an excess of expenditure over receipts of £19, the receipts for the year having been £729 15s. 1½d., and the expenditure £748 16s. 5¾d., but, on the other hand, a sum of £125 from the library revenue, after defraying, with a trifling exception, its own charges, has been expended in the purchase of books and periodicals.

BURNLEY MECHANICS' INSTITUTION.—The report for last year, 1863, says that the prosperity of the Institution has been affected by the pressure of the times. The library has been kept in good repair, and some 20 volumes of illustrated newspapers have been bound for perusal in the reading-room; 89 volumes of magazines and periodicals have been bound for circulation; and 41 miscellaneous volumes have been re-bound. The circulation of books has been greater than in any year except in that of 1862. The issues amount to 8,226, and a large number of the books read have been of a description calculated to instruct and improve. The reading-room has been amply supplied with newspapers, and with the leading reviews, magazines, and periodicals; but the proposed improvements in the room to afford larger accommodation and greater comfort to the readers have been again deferred. Nor has any attempt been made to open the long wished for conversation-room. In the evening classes the old and tried staff of teachers have been retained, several of whom have for years given their services without remuneration. The zeal with which they continue to discharge their important duties, and the deep interest they evince in the improvement of their scholars, deserve special acknowledgment. The scholars have shown steady application. In the examinations of the East Lancashire Union, 13 male students have gained merit prizes, ranging in value from 30s. each downwards; and seven have gained certificates of competency. Four female students have gained merit prizes, in value from 20s. downwards; and three have gained certificates of competency. In the examinations of the Department of Science and Art, South Kensington, five students have gained Queen's Prizes of the first class; five students, Queen's Prizes of the second class; and two students, Queen's Prizes of the third class; one has gained honourable mention; and two have passed. In the examinations of the Society of Arts, five students gained certificates of the first class; eight, certificates of the second class; and four, certificates of the third class. The results, notwithstanding the decrease of members in the evening classes, surpass those of any former year. Several young men who have acquired distinction in the examinations, have also gained the more substantial prizes of advanced employment and higher wages. The number of members on the books was 364, the same as in 1862. The number who attended the evening classes was 224, comprising—males, 177; females, 47; increase since 1862, nine. The President, Colonel Towneley, gives a donation of £20, and various other gentlemen contribute to the support of the Institution. The sum of £76 was contributed by the ladies of Burnley, at the annual *soirée*, and thus they have not only made good the deficiency in the ordinary income, but have cleared off the debt of £81, which remained at the close of 1862. The financial statement shows that the income was £606 14s. 2d., and that there is a balance in the treasurer's hands of £15 11s. 1d. Considering the great calamity that has fallen upon the industry of the district—that during part of the year one-third of the population were dependent on charity, or the parish, and that the rest have been struggling under greatly diminished means, the general condition of the Institution, if not all that could be wished, can hardly fail to be regarded otherwise than with satisfaction.

WISBECH MECHANICS' INSTITUTE.—The annual general meeting was held on Wednesday evening, the 20th April, R. Dawbarn, Esq., President, in the chair. The report of the treasurer, Mr. Theo. Smith, stated the funds of the past year had been £107 3s. 6½d. Of this, £16 4s. 3½d. was balance from last year, £74 2s. 6d. was for subscriptions, £3 8s. 8d. for the sale of newspapers, &c., £4 17s. 7d. realised by the public readings, £3 13s. 6d. by the lectures, and a donation of £5 from R. Dawbarn, Esq. The expenditure (embracing, among other items, one of £15 11s. for new books) amounted to £96 11s. 8d., thus leaving a balance for the ensuing year of £10 11s. 10½d. The report of the secretary (Mr. J. B. King) informed the meeting that there had been four lectures and five readings during the winter, that the issues of books for the past year amounted to about 2,000, that there were 1,072 volumes in the library in May last, that 103 new volumes had been since purchased. The present number of members is 204, and the average number throughout the year has been 204, against 227, average for last year. The Mayor, W. Hutchinson, Esq., was elected president. Votes of thanks were passed to the various officers for the past year, and the ex-President, in responding, said he had derived great pleasure from the public readings, and he hoped they would be continued in the next season. A member thought it would be advisable if the Institute had more lectures. The secretary stated that lectures did not pay; they had written to several eminent lecturers, but found that their terms were so high that they could not entertain them.

Manufactures.

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Boiler Explosions.—The chief engineer's report to the last monthly meeting of the Manchester Association says that during the last month 311 engines have been examined and 418 boilers, 20 of the latter being examined specially and 4 of them tested with hydraulic pressure. Of the 418 boiler examinations, 333 have been external, 11 internal, and 74 thorough. In the boilers examined 255 defects have been discovered, 4 of them being dangerous. One case of explosion, where two boilers exploded together, is specially described. In this instance the series consisted of seven, in communication one with the other, all being externally fired. The rents in both the exploded boilers had taken place at the furnace or south end, and a portion of the shell, containing three or four rings of plates, had severed itself in each instance from the remainder. As to the cause, it appears that the water with which the boilers were fed was highly corrosive, a portion of it being derived from some coal workings a short distance up the valley, in which ironworks were situated. This water had eaten into the surface of the plate in a most remarkable manner, and the reporter had never seen any so severely affected. A considerable portion of the inside of the boilers presented an appearance very similar to a honeycomb, the cells running closely one into another, and in many cases penetrating so deeply into the body of the plate as only to leave a mere film of metal about one-sixteenth of an inch thick. The corrosive action was specially active at the overlaps, where it ate away a deep channel, completely undermining the edge of the plate, and in some cases penetrating as far as the body of the rivet. This channelling was quite independent of mechanical action, being as severe at the transverse as at the longitudinal seams. The plates which were most affected by this corrosive action were those nearly over the fire-bridge at the bottom of the boiler, and in the vicinity of the feed inlet. Those on the left-hand side of the mid-feather wall were more severely attacked than those on the right, in consequence, as it would appear, of the higher temperature, since the flames from the furnace passed on that side in the first instance. The boilers did not burst simultaneously, but the explosion of one caused that of the other, as attested by the fact that those on the works at the time heard two distinct reports. The true cause of this explosion is not to be found either in excessive pressure of steam or shortness of water, but simply in the reduced thickness of the plates by the ravages of internal corrosion. It is impossible, says the report, that competent inspection could have failed to detect the danger; while there does not appear to be any reason to doubt that the daily introduction of a small quantity of common soda along with the feed would have been as successful in arresting the corrosive action in this instance as it has been in others. For the last month three explosions are reported, from which fifteen lives have been lost, and also 25 persons injured. Not one of the boilers was under the charge of the Association. One exploded boiler was of the vertical furnace class, and heated by the flames passing off from three iron furnaces. These flames played in the first instance on the outside of the boiler, then passed through three neck openings into a central internal descending flue, and thence by means of a culvert to the chimney. This is a dangerous class of boiler. It is very inconvenient for complete examination, and the plates at the bottom upon which it sits may be seriously corroded without detection unless the boiler is lifted from its seat. Also the intense flames from the reverberatory furnaces impinge directly upon the shell externally, and the fires cannot be controlled as in the ordinary grate boiler, while, in addition, from its height and its being enveloped in brickwork, the best arrangement of water-guage becomes inapplicable as well as the fittings generally inconvenient and inaccessible. But not only is this class of boiler, from these circumstances, peculiarly liable to explosion, but when it occurs the consequences are peculiarly serious. The boiler, standing erect, is enveloped in a shell of brickwork some 15 or 20 feet high, and surrounded by three or more furnaces, from the flames passing off from which it is heated. The temperature of these furnaces is very high, and their fire-brick lining, as well as the masses of iron with which they are charged, are frequently at a glowing white heat. When the boiler explodes, its brickwork casing as well as the furnaces are demolished, and the débris, much of it red-hot, is showered in every direction, so that more injury is done by the flight of the fragments than by that of the boiler itself. An examination of the shell of the boiler after the explosion left no doubt as to its cause. The boiler was an old one, and had been repeatedly patched; while the edges of the plates where the fracture had taken place were reduced by corrosion for a considerable distance to the thickness of a sheet of paper. The jury brought in a verdict of manslaughter against the fireman, as well as against the proprietor of the works, and his son, who acted as manager. Another explosion, which resulted in the death of one person and in injury to six others, occurred at a saw mill, and was due to the collapse of a furnace flue, and is an illustration of the necessity of strengthening all such flues with hoops or other suitable means. The boiler was of Cornish construction. The reporter considers that the fundamental cause of the explosion in this instance was mal-construction of the boiler. Another explosion, which resulted in the loss of two lives, affords an additional illustration of the danger so often pointed out in these reports, as attendant upon the use of externally-fired boilers, especially when they are fed with sedimentary water, and not provided with sufficient blow-out apparatus. The boiler in question was No. 3 in a series of eight, working side by side, and connected together both by the steam-pipe and feed-pipe. They were of plain cylindrical egg-ended construction, externally-fired, and set with a flush flue; their length being 40 feet, their diameter 5 feet, and thickness of plate three-eighths of an inch. The boiler gave way at one of the transverse seams of rivets situated about eight feet from the front end, and very near to the fire-bridge. The rent commenced at the bottom, and then continued throughout the entire circle of rivets, severing the shell completely into two sections. The reporter draws attention to the fact of an explosion having occurred to an externally-fired boiler, from the failure of a single transverse seam of rivets, which neither by leakage nor by any appearance of burning on the outer surface of the plate gave any warning of danger—a fact which it is thought affords a clear example of the treacherous character of this class of boiler. The reporter remarks that during a period of scarcely three months there have occurred eight explosions, from which twenty-nine persons have been killed, and forty-two others injured; while five persons connected with the management of these boilers have been committed for manslaughter. The causes of all these explosions have been extremely simple; in three cases, the choking of the feed pipes through frost; in two others, wasting of the plates to the thickness of a sheet of paper; and in the sixth the mal-construction of the boiler. Ironworks appear to maintain their position at the head of the list, both for the number and fatality of their explosions, and, under these circumstances, it may not be unwise to re-consider the policy now generally adopted at these works, viz.,—that of employing the more primitive description of engineering arrangements, in preference to those of a more modern character, and now widely adopted in other branches of industry. It is often argued that the rough class of labour obtainable at ironworks necessitates the continuance of primitive and rough mechanical appliances; an argument, it is thought, that admits of question. True economy in engineering matters is only to be found in the employment of the best material and workmanship. The continued use of inferior and rough boilers, tends to perpetuate inferior and rough workmen; while, on the other hand, the use of a superior description would stimulate and raise them. Where boilers of a superior class have been adopted, they have been found to be productive of economy in working, as well as of human life, and there can be no reason to doubt that these advantages would follow their adoption at ironworks. A very frequent source of explosion, and one by no means peculiar to any class of works, is that of having no spare boilers, so that the Sunday becomes the only day for examination and repair, when the time is too short for either to be satisfactorily done, and thus the boilers are worked on in a dangerous state. Apart from other considerations, which need not here be entered upon, the practice of Sunday work is bad engineering. Boilers are injured by being suddenly cooled, and should never either be emptied when hot, or filled with cold water. Examinations and repairs of the plates, if hastily done, are sure to be scamped, and patches temporarily and insecurely hung on with bolts, get to be substituted for soundly riveted plates. It must not be lost sight of, that explosions do not occur to those who are careful in the management of their boilers, and therefore it may fairly be asked, if the carelessness of those who allow their boilers to explode is just to the body of steam users as a whole? It cannot but be feared that the continued occurrence of these fatal explosions will at length provoke the Government to undertake a system of inspection, and however wisely such a course may be carried out, it could hardly fail to prove irksome to the steam user, and to cramp the many careful for the careless few.

Colonies.

The Athenæum and Mechanics' Institute, Otago, has, during the last year, made great progress. The year 1863 was commenced with 223 members; during the first quarter there was a rise to 314, and during the second to 436. The increase continued during the latter half, and at the close of the year there were 563 members, and a balance of £156 13s. 2d. to the credit of the Institution. The additions made to the library during the year represented 984 volumes, and the issues were 15,537.

Alpacas.—During the month of December, 1863, the flock of alpacas in New South Wales, brought five years since from South America by Mr. Ledger, have been shorn. The flock now numbers 348 animals; the number clipped was 300, and the yield was 18½ cwt., being two cwt. more than was given at the last shearing, when 420 animals were shorn. This difference is attributed to the cross-breeding and to the mortality that has occurred amongst the lambs. As the result of the cross-breeding between the alpaca and the llama, the flock now consists almost entirely of pure alpacas, born in the colony. Of the wool sent down there is only half a bale of llama; all the rest is alpaca, of the qualities that have been so highly commended by Mr. Titus Salt, of Bradford. The alpacas have recently been removed from Arthursleigh to Wingelo, an adjacent station belonging to Mr. Edward Payten, who has been appointed superintendent of alpacas. There are many facilities on the station for the separating and weaning of the lambs, so that the Government will not be called upon for much further expenditure. Upon Mr. Charles Ledger giving up the charge of the alpacas, his brother, Mr. Arthur Ledger, received the appointment, but he subsequently resigned it in consequence of what he considered the unjust treatment of his brother by the late Government. It will be remembered that the flock of alpacas were, a few months after Mr. Ledger's arrival in the colony, purchased of him by the Government. Notice has lately been given in the Assembly by Mr. Wilson, the Minister for Lands, of a resolution to the effect that it is desirable that the alpacas should be no longer retained as public property, but that they should be absolutely disposed of by the Government in such manner as may be found most convenient.

New Zealand.—A Wellington paper says:—"Whether Wellington be chosen as the new site for the seat of government, or whether its removal to Nelson or Picton takes place, this port has been rapidly acquiring for itself the character of being the natural centre for steam, and the manner in which this has been tacitly admitted by the colony has been exemplified in the new mail proposals recommended by the committee of the House of Representatives, and approved by the government. Although every year the steam services have been altered, the requirements of the times necessitate continued alteration and extension; and for a long time to come whenever the Assembly meets it will in effect have again to agree to the first of the five resolutions passed on the 7th December, 'That the whole of the existing postal steam service should be remodelled, and all existing contracts brought to a conclusion, by notice or by arrangement, as soon as possible." By the present postal service there is an average weekly communication with both north and south. The steamers leave oftener, but the clashing of dates practically reduces the six departures north and the five south to a weekly mail communication. The Assembly has recommended that there should be a weekly mail communication between Southland and Otago, Canterbury, and Wellington, a weekly communication between Wellington, Napier, and Auckland, and a weekly communication between Wellington, Picton, Nelson, Taranaki, and Manukau, provided such a service can be performed for the sum of not more than £40,000. From Wellington, therefore, there will in a few months be two mail steamers a week to the north and two a week to the south. Thus Wellington becomes the centre from which the mail service radiates."

Gold in Queensland.—From the Calliope gold fields good accounts continue to be sent, and now and again rumours of heavy finds are conveyed, either through the columns of the local journals or though private sources. A nugget weighing five pounds was certainly obtained, and instances of other large pieces being disentombed are occasionally recorded. At the Talgai diggings the miners have been following the example of the townspeople, and keeping holiday, so that no very startling accounts have been received from there of late. There appears, however, to be an impression on those who have visited the district that a good gold field will yet be found in it.

Hotels in Tasmania.—A Hobart-town paper says:—"If half a dozen people could be got together for the formation of a hotel company, similar to those which have proved so great a success in many parts of England, not only might the trade of Hobart-town, as the capital of Tasmania, be greatly stimulated, but we should have numbers of persons attracted to it, as formerly, from India, and it could not fail, at certain seasons of the year, to draw a large circle of visitors from the surrounding colonies. Many are deterred from coming, for the purposes of business or with a view to the purchase of land, who would most certainly favour us with their visits if we had only better hotel accommodation. And there are others who have heard of our salubrious climate and of our charming scenery, but have never felt the effects of the former nor had an opportunity of judging of the beauties of the latter, under the impression that they should pay too dearly for it in the want of good hotel accommodation if they made the attempt."

Steam Tugs on the Waikato are shortly expected, their intended use being to take up supplies to the military settlements to be founded along the banks of the river. Their light draft of water and power will fit them for this special duty. It is likewise intended to build a number of flats, to be towed by these steamers, and which may be detached at the various settlements as they proceed up, on the return trip the empty cargo of flats being taken back. Thus a constant communication will be kept up.

Coal in New Zealand.—A Nelson paper says that although there is abundant evidence of the existence of coal of the best quality and unlimited in quantity, the inhospitable nature of the coast, the want of good harbours and resident settlers, make it difficult to establish confidence among private capitalists so as to induce them to embark in the working of a coal-field. The local government had resolved to assist, but the ordinary revenue does not admit of such assistance, and it was resolved to obtain a loan. Captain Clouston, in his recent survey of the Mokihinui harbour, speaks favourably of the facilities for steam colliers built expressly for the service, and thinks that such vessels, having no greater draught of water than eight feet, might with safety trade between Nelson and Mokihinui. The coal crops out in good workable seams at several spots on the banks, the nearest place being only two miles from the sea. It is superior to Sydney Newcastle coal, and little if at all inferior to the best English. The largest beds are thirteen feet thick. Gold continues to come in from the Upper and Lower Buller in a coarse and nuggetty form, but the country is so inaccessible at present, in spite of £25,000 worth of bridle and foot tracks, that old hands are getting more and more shy of the speculation. It is only by settling the interior that this wealth will be developed.

Agriculture in New Zealand.—The grass crop has been a great deal of it gathered in, and the produce has been universally abundant. Although there were frequent showers yet the hay has been almost universally well got. Evaporation proceeds so quickly in this climate that although frequently straightened for hands the farmer has been able to render the fine weather sufficient for his purposes. The growing wheat crop also promises generally to be a highly productive one.

Tobacco Cultivation in the Cape Colony.—At the Humansdorp Agricultural Show, Mr. C. A. Rautenbach, of Wolve Kraal, Humansdorp, Eastern Province, obtained the first prize of £15 for the best sample of colonial-grown tobacco. Tobacco has been grown in the Cape Colony for many years, but owing to the fact that the farmers manufacture it in the most primitive style, rolling the leaves up rope-fashion, and drying it in the sun, in which state it is called boors' (farmers') tobacco, it is only used by farmers themselves and their black and white servants. Lately, those who are anxious that the capabilities of the colony should be more fully developed have pointed to the fact that there are isolated instances in several parts of the colony of farmers producing several kinds of tobacco. These farmers have proved that the soil is capable of growing every known species of the plant in great perfection, and it was felt that some encouragement should be held out to farmers to depart from the orthodox fashion and turn out the leaf in the "Cavendish" or "Golden leaf" style Mr. Rautenbach did this on the occasion in question. He produced a hundred pounds weight of tobacco done up in cakes, and looking exceedingly handsome, although a close inspection revealed the fact that much knowledge and experience was yet required in the preparation. The judges unanimously awarded Mr. Rautenbach the first prize, and he has engaged to produce one thousand pounds weight from his next crop. The plant produces three crops of leaves per annum in this colony, is strong and healthy, and transplants with ease. Many farmers in the colony are anxious to prepare this article of commerce fit for the export market, but owing to their being placed in such an isolated position, and this colony being to a great extent ignored by the world, they have neither means nor the knowledge to enable them to compete with other markets. Any information on the subject would be gladly received, and distributed among the Cape farmers, on being addressed to Mr. A. Barfield, editor of the *Telegraph* and *Standard*, Port Elizabeth. It should be observed that the eastern province, of which Port Elizabeth is the chief port, and which exports nearly a hundred thousand bales of wool per annum, is the English portion of the colony, and has much more energy, perseverance, and wealth than the western province, which is chiefly Dutch.

Obituary.

The Right Rev. George Davys, D.D., Lord Bishop of Peterborough, who died at the age of 84 years, was born on the 1st October, 1780, and was the son of Mr. John Davys, of Loughborough, Leicestershire, and of Rempstone, Nottinghamshire, by Sophia, daughter of the Rev. B. Wigley, of Sawley, Derbyshire. He was of Christ's College, Cambridge, graduating as tenth wrangler in 1803—when Archdeacon Hoare was second wrangler and second chancellor's medalist, and Lord Wensleydale fifth wrangler and senior chancellor's medalist. He was ordained deacon in 1806, and priest in 1809. In 1811 he became possessed of the advowson of the small rectory of Willoughby-on-the-Wolds, Nottinghamshire, value £87; population 465, and took pupils. In 1814 he married Marianne, daughter of the Rev. E. Mapletoft, rector of Anstey, Hertfordshire, who died December 3rd, 1859. He held Willoughby till 1831, two years previous to which he was presented by the Lord Chancellor to the rectory of Allhallows, London-wall, value £450; population 1861. At this time he was nominated preceptor to her Royal Highness the Princess Victoria, and he resided at Kensington. In 1831 he was made Dean of Chester, on the promotion of Dr. Philpotts to the episcopal bench. In 1839 he was consecrated Bishop of Peterborough, on which occasion he resigned his deanery and his London living. As a bishop, Dr. Davys was universally respected for the simplicity of his life, and the gentleness and affability of his manners. Of all religious societies, of all local institutions, he was a liberal and hearty supporter, and identified himself with all the useful and honourable movements within his diocese. As a writer, he produced several children's books of history which are still text books in schools, and various cottage tracts.

The name of James Beadel has been familiar to landed proprietors and agriculturalists for the last thirty years, as head of the well-known firm of Beadel and Sons. There were few men more thoroughly acquainted with land, its value and requirements, and few indeed on whose word both tenant and landlord were more content to rely. He had long been a Commissioner of the Essex turnpike roads, attending the meetings occasionally, and assisting by his practical advice. He was, too, one of the founders of the Central London Farmers' Club, to the success and usefulness of which he contributed by his lectures, being ever ready to use his influence for carrying out on the farm the views and principles he broached in the club-room, especially in respect to covered homesteads, which were adopted by his efforts and under his superintendence on several large estates. By these things he will be remembered as one of the practical agricultural improvers of the day, while in private life the qualities of his heart and his frank open bearing will cause him to be widely mourned as a friend. He was born on the 2nd of December, 1799, at Witham, where his family had been settled for many years. He claimed descent from Bishop Beadel, of Kilmorey, in Ireland, who was also a native of Essex. Mr. Beadel retired from business about two years before death, owing to an attack of paralysis, and he died on the 22nd of November, 1863. He was elected a member of the Society of Arts in 1852.

Forthcoming Publications.

Twelve Songs from the Plays of Shakespeare: illuminated with suitable borders in gold and colours, partly after illuminated works of the fifteenth and sixteenth centuries. By Mrs. Hoskyns-Abrahall. (*Day and Son.*) The work is about to be published by subscription, and will consist of 12 pages quarto, price one guinea, and will comprise the following songs:—1. "Full fathom five thy father lies," *Tempest;* 2. "Where the bee sucks," *Tempest;* 3. "Who is Sylvia?" *Two Gentleman of Verona;* 4. "Come away, come away, Death!" *Twelfth Night;* 5. "Take, oh! take those lips away," *Measure for Measure;* 6. "You spotted snakes," *Midsummer Night's Dream;* 7. "When daisies pied," *Love's Labour's Lost;* 8. "Tell me where is fancy bred," *Merchant of Venice;* 9. "Under the greenwood tree," *As You Like it;* 10. "Blow, blow, thou winter wind!" *As You Like it;* 11. "Come, thou monarch of the vine!" *Antony and Cleopatra;* 12. "Hark! hark! the lark at heaven's gate sings." *Cymbeline.*

Notes.

Silk-worms.—M. Onesti has found that wood soot, if sprinkled over silk-worms attacked with *fébrine*, effects an almost certain cure, or, at all events, prolongs their lives until the cocoons are finished. The Minister of Agriculture has addressed a circular to the *préfets* of the sericultural departments of France, and has requested that a commission be formed to report on the value of M. Onesti's discovery. A very interesting letter from M. Guerin-Menneville, printed in a recent number of *Les Mondes*, gives many particulars of the progress of sericulture in France. Among other things, it is mentioned that M. Simon, charged with a mission to China to report on the best breeds of worms, *inter alia*, has sent home a box of eggs *viâ* Siberia, which have arrived safely, and are now being distributed, and are also being experimented on at the Imperial farm at Vincennes.

Value of Land in the City of London.—It is stated by Mr. Alderman Mechi, in a letter in the *Gardeners' Chronicle*, that a good deal of land about the Royal Exchange is now worth one million five hundred pounds per acre, and that a site in that neighbourhood, about the size of a nobleman's drawing-room, would command a ground rental of £1,000 per annum, equal to the rental of a thousand acre farm.

Roberts Testimonial.—A meeting took place on Wednesday, the 27th inst., in the rooms of the Society of Arts, to concert measures for raising a fund for a testimonial which shall properly record the eminent services of the late Richard Roberts. Admiral Sir Edward Belcher was called to the chair; and letters were read from the Duke of Sutherland, the Earl of Caithness, Lord Stanley, M.P., Mr. Pender, M.P., and others, expressing their sympathy with the cause, and authorising their names to be placed on any committee which might be formed. The following resolutions were passed:—Proposed by W. Fairbairn, Esq., F.R.S., and seconded by Thomas Bazley, Esq., M.P., "That this meeting is of opinion that the eminent services which Mr. Richard Roberts has rendered to the manufacturing industry of this country, and to the world at large, by his useful inventions, demand some substantial and permanent record; and that the most appropriate tribute to his memory would be in the first instance to provide for the independence of his only daughter." Proposed by Thos. Webster, Esq., F.R.S., and seconded by Zerah Colburn, Esq., "That a fund be raised by public subscription, and that the following gentlemen be appointed as a committee to carry out the objects of the foregoing resolution:—The Duke of Sutherland; the Earl of Caithness; Right Hon. Lord Stanley, M.P.; Admiral Sir E. Belcher; J. Pender, M.P.; Thos. Bazley, M.P.; W. Fairbairn; Thos. Webster; Col. French; Bennet Woodcroft; S. B. Lumb; Zerah Colburn; E. Jones; P. Le Neve Foster, Hon. Sec.; with power to add to their number."

Correspondence.

The Proposed New Buildings at South Kensington.—Sir,—The present state of the Exhibition Building, with one dome only standing, affords an opportunity of testing what should be the character of the upper features of any building which may hereafter be erected in Cromwell-road, that is, in so far as its effect is to conduce to that of the Horticultural Gardens. I would invite any one interested in the subject to take his stand in front of the conservatory, and then look alternately towards that corner where the dome still remains, and towards that where it has been removed. I think it will be perceived at once that the gardens look much larger when looking towards the corner where the dome has been removed than towards that where it yet remains. It is evident in fact that the large proportion of the dome dwarfs the intervening space, and the whole appearance of the gardens in that direction. Noble as large proportions in architecture are of themselves, yet in some respects and cases they are to be avoided. To what does this point? I would say evidently to any future building on the site of the exhibition having such features of sky line as should produce their effect chiefly by elegance and repetition rather than by great size. The shortcomings in the Horticultural Gardens are chiefly those which arise from their small area, and nothing could be more erroneous than emphasizing these by features of great size (especially in the skyline) of any building hereafter to be erected on a site so contiguous, and which must by its position always form part of the *coup-d'œil* from the gardens. I would also add that it would be well to keep an open space in the centre of the façade in the Cromwell-road, so as to afford a view to the outside public (to the working man in fact) of the Horticultural Gardens, and of the memorial of the exhibition surmounted by the statue of the late Prince Consort. The new buildings in fact would then be in two blocks or groups rather than in one, and the centre open space would not only afford a distant perspective view of the gardens, and be a great relief to the effect in Cromwell-road, but would also give the edifice a space for carriages to set down and take up on its own ground, and likewise afford suitable opportunities for introducing a variety of artistic decoration of various and appropriate kinds for the open air, as mosaics, sculpture, &c.; and if some portion of this space were in addition roofed with glass, carriages might set down and take up under cover. Besides this also, the adjuncts of beautiful plants and pictures in water glass might in this case be introduced, or even large distemper paintings, as cartoons of design and colour for mosaics, which might afterwards be executed from them, and which probably will be found to be the only kind of pictorial mural decoration that will be really lasting in this country.—I am, &c., Epsilon.

The Bradfield Reservoir.—Sir,—Your correspondent on this subject in the last number of the *Journal*, attributes the cause of the late disaster to the inefficient manner in which the puddle-wall was made. This appears to me to be the unanimous verdict of all who have given judgment on the question. I have not been to the scene, and all I know of it is from description, and from a drawing in the *Illustrated London News*. Without differing from the opinions of those who have already pronounced, I wish, as I have not seen this feature of the subject adverted to, to say a word or two on the form of the embankment, which, as I learn from the drawing mentioned, is in a straight line. Imagine the weight of 114,000,000 cubic feet of water; add to that its percussive force as it swept in large waves along the entire length of the reservoir: and one can easily understand the enormous lateral strain to which the embankment would be subjected. Now, had its form been that of an inverted arch, that is to say, with its crown inwards, I think I dare venture to say that even with the inferior material and labour employed, the work would have been capable of resisting the pressure brought against it. Of course, I assume the buttresses to be firmly set; and the springs of the arch would require to be protected within the reservoir by a superficial straight line of masonry.—I am, &c., B.

MEETINGS FOR THE ENSUING WEEK.

Mon. ...Entomological, 7.
British Architects, 8. Annual Meeting.
Asiatic, 3.
Royal Inst., 2. Anniversary Meeting.
R. United Service Inst., 8½. Mr. H. Bessemer, "Employment of Cast Steel for the Manufacture of Ordnance and Projectiles."
Tues. ...Civil Engineers, 8. 1. Discussion upon "Locomotive Engines for Steep Gradients and Sharp Curves," and upon "Impedimental Friction between Wheel Tires and Rails." 2. M. Pernolet, "Manufacture of Coke."
Pathological, 8.
Photographic, 8.
Anthropological, 8.
Royal Inst., 3. Professor Marshall, "On Animal Life."
Wed....Society of Arts, 8. Mr. F. A. Paget, "On the Testing of Chain Cables."
R. Society of Literature, 8½.
Thur. ...Society of Arts, 8. Cantor Lectures. Dr. Crace Calvert, "Chemistry applied to the Arts—Animal Liquids."
Antiquaries, 8.
Linnæan, 8.
Chemical, 8. Sir B. C. Brodie, "On the Organic Peroxides Theoretically Considered."
Artists and Amateurs, 8.
Royal Inst., 3. Mr. John Hullah, "On Music (1600—1750).'
Fri.......Philological, 8.
Royal Inst., 8. "On Iridium, &c."
Archæological Inst., 4.
Sat......Royal Inst., 3. Prof. Frankland, "On the Metallic Elements."

Patents.

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From Commissioners of Patents Journal, April 22nd.

Grants of Provisional Protection.

Air, &c., forcing, blowing, or exhausting—801—J. G. Beckton.
Arming war vessels—929—J. Burchall and E. Burrows.
Bottles, &c., fixing or closing capsules on—J. Neilson and J. Gillies.
Churning and butter-making machines—778—T. Bradford.
Crinolines—873—J. H. Johnson.
Drilling machine, portable—691—B. Fowler, jun.
Easel, combination—829—F. Potts and A. H. Green.
Electric or telegraphic conductors—833—W. E. Newton.
Fibrous materials, preparing and spinning—811—J. Greenwood.
Fibrous materials, treating vegetable—887—W. Clark.
Gutta-percha, leather, &c., preparation of—735—W. Forgie.
Hats, &c., looms for weaving—815—W. E. Newton.
Horticultural structures, glazing of—875—C. Beard.
Iron or steel plates, water-tight joints in—803—H. H. Mills.
Iron ships, applying metal sheathing to—849—G. B. Cornish.
Kilns or retorts for cooking, &c.—355—T. V. Lee.
Lamps—903—A. Smith.
Lighthouses, &c., construction of—845—J. N. Douglass.
Looms—767—C. Hartley.
Looms—858—J. Nichols.
Looms for weaving cords, &c.—837—J. Smith.
Looped fabrics, manufacture of—919—W. Gadd, jun.
Machines, electro-magnetic induction—899—J. B. Thompson.
Manufactories, instrument for registering the time of arrival and departure of work-people in—821—J. Hunt.
Manures—773—J. Robbins.
Metals, applying pressure to the rolling and drawing of—909—M. A. F. Mennons.
Minerals, getting or cutting—895—J. Nisbet.
Mines, &c., apparatus for pumping water out of—835—T. Briggs, jun.
Motive power, transmitting and multiplying—917—W. Clark.
Mowing and reaping machines—915—M. L. Peters and W. Harkes.
Oil cans, &c.—855—W. Clark.
Ordnance, &c., breech-loading—869—J. Snider, jun.
Paper manufacture—817—J. J. Lundy and R. Irvine.
Photography—843—N. Sarony.
Pipes, joints and stop-cocks for—923—W. E. Newton.
Plate glass, machinery for grinding, &c.—881—N. Wood and J. Stockley.
Pouches, cartridge and percussion cap—851—W. Clark.
Printed woollen velvets or plushes—859—E. T. Hughes.
Printing from type by electricity—893—J. H. Simpson.
Pumps, rotatory—889—A. Rodger.
Purse frames, &c., ornamenting steel and wrought iron for—867—F. Weintraud.
Railway carriages, oil boxes for oiling the axletrees of—911—F. G. Piemont.
Railway engines, &c., safety hooks and couplings for—913—T. Chamberlayne.
Railway rails, &c.—807—E. Stott.
Railway signals—853—E. D. Chattaway.
Railway signals from a train in motion—861—W. T. C. Pratt.
Railways, connecting rails for—907—A. Earnshaw.
Railways, permanent way of—863—J. H. Johnson.
Refrigerators—877—J. Picking.
Reservoirs, &c., regulating the flow and level of water from—879—J. Lascelles.
Sapota mulleri or bullet tree, juice of—820—S. W. Silver.
Ships, construction and ventilation of—847—A. McLaine.
Ships, life, and property at sea, &c., preservation of—772—J. Rees.
Spinning frames, self-acting saddle for wet flax—738—W. Leuty.
Surface condensers, construction of—891—J. Jordan.
Table tops, fastening of—727—J. Edis.
Textile fabrics and yarns, sizing of—857—J. Lightfoot.
Textile fabrics, dyeing and printing—769—J. Lightfoot.
Thermometer, maximum mercurial—809—J. Hicks.
Umbrellas, manufacture of—813—E. Ambrose.
Walking sticks, &c., applying an almanack or a thermometer to—799—M. Kurts.
Warming and ventilating, apparatus for—831—T. Richard.
Watches, lockets, &c., fastenings for attaching—927—W. Reading.
Weights, machinery for raising—897—A. B. Brown.
Window sashes—805—W. Holbrook.

Patents Sealed.

2636. R. Littleboy.
2637. B. Steinmetz.
2643. W. E. Gedge.
2644. I. Baggs.
2645. J. Willcox.
2646. A. Blake.
2647. E. Clifton & B. Greenwood.
2650. J. C. Wilson.
2654. J. Hutchinson and J. Hollingworth.
2656. R. Smith.
2664. S. Procter.
2665. E. Oldfield.
2686. F. Durand.
2717. R. Eaton.
2751. C. Coates.
3105. J. Wright.
3233. D. Adamson.
48. J. Ramsbottom.

From Commissioners of Patents Journal, April 26th.

Patents Sealed.

2672. R. B. Jones.
2673. J. Kennedy.
2674. R. A. Brooman.
2679. A. R. Le Mire Normandy.
2680. F. N. Gisborne.
2681. J. Nash.
2687. M. J. Roberts.
2689. A. Turner and W. E. Newton.
2690. B. Russ.
2696. J. H Johnson.
2700. W. Tasker, jun.
2702. W. Law.
2705. W. Pope.
2706. J. Wilson.
2707. S. Holman.
2708. E. Jones.
2713. T. W. Alderton.
2714. F. J. Pastorelli.
2720. J. J. Revy.
2722. J. Livesey and J. Edwards.
2732. J. H. Maw.
2762. W. H. Perkin.
2803. D. Dawson.
2817. G. Davies.
2828. W. Robertson.
2852. W. E. Newton.
2878. W. Cowan.
2894. H. Hirzel.
2936. F. Watkins.
3044. J. Bowron and G. Robinson.
3204. E. T. Hughes.
251. J. Marshall.
265. H. Bessemer.
319. C. Mather.
492. E. C. Shepard.

Patents on which the Stamp Duty of £50 has been Paid.

994. A. Dugdale.
976. W. and T. Ryder.
980. R. A. Brooman.
1017. F. J. Bramwell.
1081. W. Horn.
1041. J. S. Templeton.
1051. F. C. Warlich.
1085. F. J. Bramwell & W. Owen.

Patents on which the Stamp Duty of £100 has been paid.

1290. R. Bennett.
1153. W. C. Cambridge.
1160. W. Clark.
1150. R. Bodmer.
1167. S. Sunderland and R. Dean.